AGENDA ITEM NO. 6.b.

City of Garden Grove

INTER-DEPARTMENT MEMORANDUM

To:	Matthew Fertal	From:	Keith G. Jones
Dept:	City Manager	Dept:	Public Works
Subject:	DESIGN SERVICES FOR FIBER OPTIC SIGNAL INTERCONNECT SYSTEM, PHASE II	Date:	March 24, 2009

OBJECTIVE

To select a consultant to provide civil engineering design services for Fiber Optic Signal Interconnect System, Phase II.

BACKGROUND

The City of Garden Grove recently received two grants from OCTA's Combined Transportation Funding Program (CTFP) and also approval for an allocation under the County of Orange Prop 1B Program to design the Fiber Optic Signal Interconnect System, Phase II. The project consists of replacing approximately 18.5 miles of existing twisted pair with fiber optic cable, replacing 18 Closed Circuit Television Cameras, upgrading 63 traffic signal controllers, and integrating the new traffic control system to support the new fiber optic/ethernet system. The goal of this project is to enhance the signal synchronization and operational effectiveness along the project corridors and thereby increasing mobility and reducing travel times. This project will also complete the replacement of all the twisted pair interconnect cable with fiber optic cable for the entire traffic signal system. Phase I completed approximately 18 miles of new fiber optic cable.

DISCUSSION

Requests for proposals were sent to four qualified engineering consultants to provide design services. Out of the four, two consultants responded. A panel consisting of three staff members rated the proposals on the basis of qualifications, work plan and references. Based on the evaluation results, RBF Consulting rated the highest. The following is a summary of the ratings:

	RBF Consulting	**IBI Group**
Rater A	195	177
Rater B	188.5	139
Rater C	178.5	145.5
Totals	**562**	**461.5**

The design will cost $208,526. The above mentioned CTFP grants will fund $160,000 and the County of Orange Prop 1B allocation will pay for the remainder $48,526. Once completed, the City will have final plans, specifications, and engineer's estimate so that the project could be ready to bid on construction. The Consultant Agreement complies with City Purchasing guidelines.

FINANCIAL IMPACT

There will be no impact to the General Fund.

COMMUNITY VISION IMPLEMENTATION

This project is consistent with the community vision for safe neighborhoods in addressing issues of traffic safety.

RECOMMENDATION

It is recommended that the City Council:

- Award consultant contract for civil engineering design services to RBF Consulting for the Fiber Optic Signal Interconnect System, Phase II project.
- Authorize the City Manager and City Clerk to execute the consultant agreement with RBF Consulting with a not-to-exceed amount of $208,526.

KEITH G. JONES
Public Works Director

By: Dan Candelaria, P.E., T.E.
City Traffic Engineer

Recommended for Approval

Matthew Fertal
City Manager

Attachment – Consultant Agreement

Attachment

CONSULTANT AGREEMENT

RBF CONSULTING

THIS AGREEMENT is made this 24th day of March, 2009, by the CITY OF GARDEN GROVE, a municipal corporation, ("CITY"), and RBF CONSULTING, a California corporation, ("CONSULTANT").

RECITALS

The following recitals are a substantive part of this Agreement:

1. This Agreement is entered into pursuant to Garden Grove Council authorization dated March 24, 2009.

2. CITY desires to utilize the services of CONSULTANT to provide professional engineering design services as detailed in the attached proposal.

3. CONSULTANT is qualified by virtue of experience, training, education and expertise to accomplish services.

AGREEMENT

THE PARTIES MUTUALLY AGREE AS FOLLOWS:

1. **Term of Agreement.** This Agreement shall cover services rendered from date of this agreement until terminated.

2. **Services to be Provided.** The services to be performed by CONSULTANT shall consist of the following: to provide professional engineering design services for the City of Garden Grove's Fiber Optic Signal Interconnect Phase II Project as detailed in the attached proposal.

3. **Compensation.** CONSULTANT shall be compensated as follows:

   3.1 Not to Exceed. Compensation under this Agreement shall not exceed $208,526.00 (Two hundred eight thousand five hundred twenty six dollars).

   3.2 Payment. For work under this Agreement, payment shall be made per monthly invoice. For extra work not a part of this Agreement, a written authorization by CITY will be required and payment shall be based on hourly rates in the attached proposal.

   3.3 Records of Expenses. CONSULTANT shall keep complete and accurate records of payroll costs, travel and incidental expenses. These records will be made available at reasonable times to CITY.

   3.5 Termination. CITY shall have the right to terminate this Agreement, without cause, by giving thirty (30) days written notice of termination. If the project is terminated by CITY, then the provisions of paragraph 3 would apply to that portion of the work completed.

4. **Insurance Requirements.**

4.1 COMMENCEMENT OF WORK. CONSULTANT shall not commence work under this Agreement until all certificates and endorsements have been received and approved by the CITY. All insurance required by this Agreement shall contain a Statement of Obligation on the part of the carrier to notify the CITY of any material change, cancellation, or termination at least thirty (30) days in advance.

4.2 WORKERS COMPENSATION INSURANCE. For the duration of this Agreement, CONSULTANT and all subcontractors shall maintain Workers Compensation Insurance in the amount and type required by law, if applicable.

4.3 INSURANCE AMOUNTS. CONSULTANT shall maintain the following insurance for the duration of this Agreement:

(a) Commercial general liability in the amount of $1,000,000 per occurrence; (**claims made and modified occurrence policies are not acceptable**); Insurance companies must be acceptable to CITY and have a Best's Guide Rating of A-Class VII or better, as approved by the CITY.

(b) Automobile liability in the amount of $1,000,000 combined single limit; Insurance companies must be acceptable to CITY and have a Best's Guide Rating of A-Class VII or better, as approved by the CITY.

(c) Professional liability in the amount of $1,000,000 per occurrence; Insurance companies must be acceptable to CITY and have a Best's Guide Rating of A-Class VII or better, as approved by the CITY.

An Additional Insured Endorsement, ongoing and completed operations, for the policy under section 4.3 (a) shall designate CITY, its officers, officials, employees, agents, and volunteers as additional insureds for liability arising out of work or operations performed by or on behalf of the CONSULTANT. CONSULTANT shall provide to CITY proof of insurance and endorsement forms that conform to city's requirements, as approved by the CITY.

An Additional Insured Endorsement for the policy under section 4.3 (b) shall designate CITY, its officers, officials, employees, agents, and volunteers as additional insureds for automobiles owned, leased, hired, or borrowed by the CONSULTANT. CONSULTANT shall provide to CITY proof of insurance and endorsement forms that conform to CITY's requirements, as approved by the CITY.

For any claims related to this Agreement, CONSULTANT's insurance coverage shall be primary insurance as respects CITY, its officers,

officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the CITY, its officers, officials, employees, agents, or volunteers shall by excess of the CONSULTANT's insurance and shall not contribute with it.

5. **Non-Liability of Officials and Employees of the CITY.** No official or employee of CITY shall be personally liable to CONSULTANT in the event of any default or breach by CITY, or for any amount, which may become due to CONSULTANT.

6. **Non-Discrimination.** CONSULTANT covenants there shall be no discrimination against any person or group due to race, color, creed, religion, sex, marital status, age, handicap, national origin or ancestry, in any activity pursuant to this Agreement.

7. **Independent Contractor.** It is agreed to that CONSULTANT shall act and be an independent contractor and not an agent or employee of CITY, and shall obtain no rights to any benefits which accrue to CITY'S employees.

8. **Compliance With Law.** CONSULTANT shall comply with all applicable laws, ordinances, codes and regulations of the federal, state and local government.

9. **Disclosure of Documents.** All documents or other information developed or received by CONSULTANT are confidential and shall not be disclosed without authorization by CITY, unless disclosure is required by law.

10. **Ownership of Work Product.** All documents or other information developed or received by CONSULTANT shall be the property of CITY. CONSULTANT shall provide CITY with copies of these items upon demand or upon termination of this Agreement.

11. **Conflict of Interest and Reporting.** CONSULTANT shall at all times avoid conflict of interest or appearance of conflict of interest in performance of this Agreement.

12. **Notices.** All notices shall be personally delivered or mailed to the below listed addresses, or to such other addresses as may be designated by written notice. These addresses shall be used for delivery of service of process.

(a) Address of CONSULTANT is as follows:

Carlos Ortiz, P.E., T.E., P.T.O.E.
RBF Consulting
14725 Alton Pkwy
Irvine, CA 92618

(b) Address of CITY is as follows (with a copy to):

Dan Candelaria, P.E., T.E.	City Attorney
P.O. Box 3070	City of Garden Grove
11222 Acacia Parkway	P.O. Box 3070
Garden Grove, CA 92840	Garden Grove, CA 92840

13. **CONSULTANT'S Proposal.** This Agreement shall include CONSULTANT'S proposal or bid which shall be incorporated herein. In the event of any inconsistency between the terms of the proposal and this Agreement, this Agreement shall govern.

14. **Licenses, Permits and Fees.** At its sole expense, CONSULTANT shall obtain a **Garden Grove Business License**, all permits and licenses as may be required by this Agreement.

15. **Familiarity With Work.** By executing this Agreement, CONSULTANT warrants that: (1) it has investigated the work to be performed; (2) it has investigated the site of the work and is aware of all conditions there; and (3) it understands the facilities, difficulties and restrictions of the work under this Agreement. Should CONSULTANT discover any latent or unknown conditions materially differing from those inherent in the work or as represented by CITY, it shall immediately inform CITY of this and shall not proceed, except at CONSULTANT'S risk, until written instructions are received from CITY.

16. **Time is Important.** Time is an important element in the performance of this Agreement.

17. **Limitations Upon Subcontracting and Assignment.** The experience, knowledge, capability and reputation of CONSULTANT, its principals and employees were a substantial inducement for CITY to enter into this Agreement. CONSULTANT shall not contract with any other entity to perform the services required without written approval of the CITY. This Agreement may not be assigned voluntarily or by operation of law, without the prior written approval of CITY. If CONSULTANT is permitted to subcontract any part of this Agreement, CONSULTANT shall be responsible to CITY for the acts and omissions of its subcontractor as it is for persons directly employed. Nothing contained in this Agreement shall create any contractual relationship between any subcontractor and CITY. All persons engaged in the work will be considered employees of CONSULTANT. CITY will deal directly with and will make all payments to CONSULTANT.

18. **Authority to Execute.** The persons executing this Agreement on behalf of the parties warrant that they are duly authorized to execute this Agreement and that by executing this Agreement, the parties are formally bound.

19. **Indemnification.** To the fullest extent permitted by law, CONSULTANT agrees to protect, defend, and hold harmless CITY and its elective or appointive boards, officers, agents, and employees from any and all claims,

liabilities, expenses, or damages, including attorneys' fees, for injury or death of any person, or damages, including interference with use of property, arising from the negligence, recklessness and/or intentional wrongful conduct of CONSULTANT, CONSULTANT'S agents, officers, employees, subcontractors, or independent contractors hired by CONSULTANT in the performance of the Agreement. The only exception to CONSULTANT'S responsibility to protect, defend, and hold harmless CITY, is due to the negligence, recklessness and/or wrongful conduct of CITY, or any of its elective or appointive boards, officers, agents, or employees.

This hold harmless agreement shall apply to all liability regardless of whether any insurance policies are applicable. The policy limits do not act as a limitation upon the amount of indemnification to be provided by CONSULTANT.

20. **Modification.** This Agreement constitutes the entire agreement between the parties and supersedes any previous agreements, oral or written. This Agreement may be modified only by subsequent mutual written agreement executed by CITY and CONSULTANT.

21. **Waiver.** All waivers of the provisions of this Agreement must be in writing by the appropriate authorities of the CITY and CONSULTANT.

22. **California Law.** This Agreement shall be construed in accordance with the laws of the State of California. Any action commenced about this Agreement shall be filed in the central branch of the Orange County Superior Court.

23. **Interpretation.** This Agreement shall be interpreted as though prepared by both parties

24. **Preservation of Agreement.** Should any provision of this Agreement be found invalid or unenforceable, the decision shall affect only the provision interpreted, and all remaining provisions shall remain enforceable.

(Signature block on next page)

IN WITNESS THEREOF, these parties hereto have caused this Agreement to be executed as of the date set forth opposite the respective signatures.

"CITY"
CITY OF GARDEN GROVE

Dated: _____ , 2009

By: _____
City Manager

ATTEST

_____
City Clerk

Dated: _____ , 2009

"CONSULTANT"
RBF Consulting

By: _____
Title: Sr. Vice-President

Dated: March 2 , 2009

APPROVED AS TO FORM:

Omar Sandoval, for
Garden Grove City Attorney

Dated: 2-12 , 2009

RBF CONSULTING

2/5/2009

CITY OF GARDEN GROVE
ENGINEERING DESIGN SERVICES
FIBER OPTIC SIGNAL INTERCONNECT SYSTEM, PHASE II

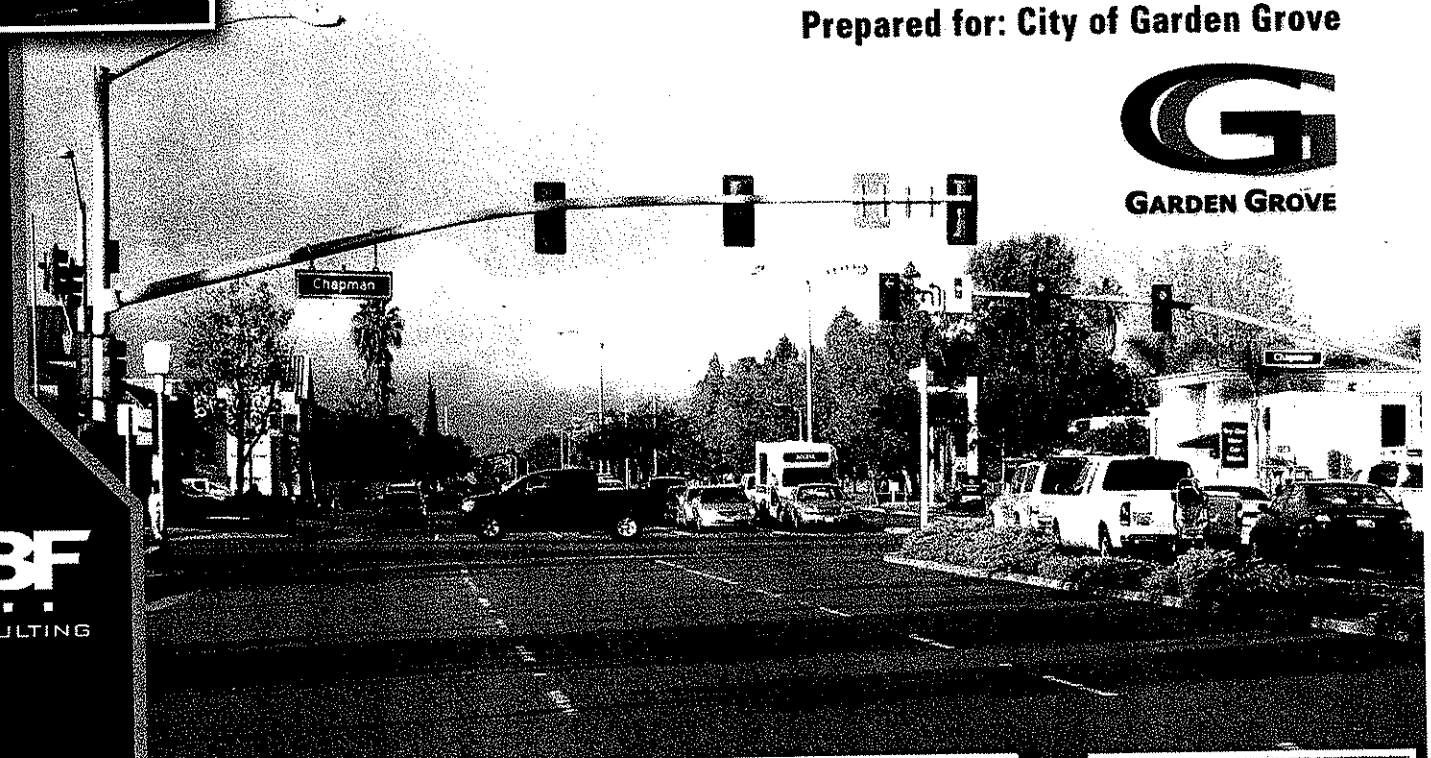
TASK	DESCRIPTION	NO. OF SHEETS	PROJECT/FUNCTIONAL MANAGER $198 per hour		PROJECT ENGINEER $144 per hour		DESIGN ENGINEER $132 per hour		CADD TECHNICIAN $95 per hour		SUBCONSULTANTS		TOTAL	
		Shts	Hours	$	Hours	$	Hours	$	Hours	$	Hours	$	Hours	$
	FIBER OPTIC SIGNAL INTERCONNECT SYSTEM, PHASE II													
1	Data Collection and Survey of Existing Conditions		8	$1,584	20	$2,880	124	$16,368	18	$1,710		$0	170	$22,542
2	Utility Notification and Coordination		2	$396	8	$1,152	24	$3,168	32	$3,040		$0	66	$7,756
3	Fiber Optic Communication, CCTV, and Traffic Signal Controller Replacement Plans	65	24	$4,752	124	$17,856	198	$26,136	464	$44,080		$0	810	$92,824
4	Fiber Optic Communication, CCTV, Traffic Signal Controller, Traffic Signal Management Details - *Fiber Assignment Details*	21	8	$1,584	32	$4,608	84	$11,088	128	$12,160		$0	252	$29,440
	Fiber Optic Communication, CCTV, Traffic Signal Controller, Traffic Signal Management Details	8	2	$396	8	$1,152	16	$2,112	32	$3,040		$0	58	$6,700
5	Technical Specifications		6	$1,188	24	$3,456	30	$3,960		$0		$0	60	$8,604
6	Engineer's Estimates		2	$396	18	$2,592	34	$4,488		$0		$0	54	$7,476
7	Permits and Approvals		4	$792	16	$2,304	32	$4,224		$0		$0	52	$7,320
8	Project Coordination and Meetings Attendance		16	$3,168	30	$4,320	10	$1,320		$0		$0	56	$8,808
9	Project Design Notebook		0	$0	0	$0	4	$528		$0		$0	4	$528
10	Construction Assistance		8	$1,584	16	$2,304	20	$2,640		$0		$0	44	$6,528
SUBTOTAL -		94	80	$15,840	296	$42,624	576	$76,032	674	$64,030		$0	1626	$198,526
Reimbursables Expenses (Mileage, Reproduction Fees, Etc.)														$10,000
TOTAL -														$208,526

PROPOSAL

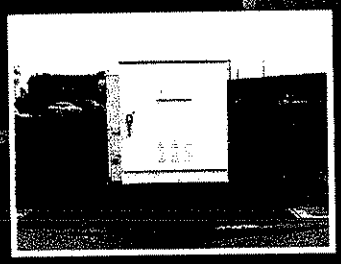
Engineering Design Services for Fiber Optic Signal Interconnect System, Phase II

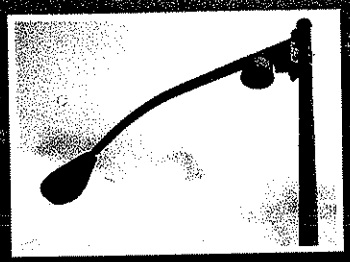
Prepared for: City of Garden Grove

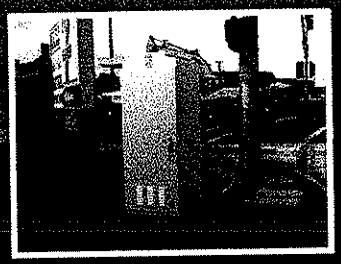
GARDEN GROVE

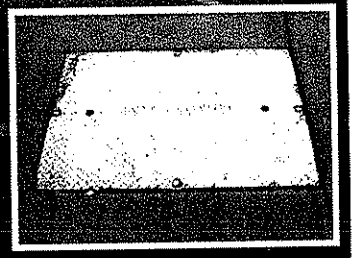


RBF CONSULTING









RBF CONSULTING

December 18, 2008

JN: 10-106656

Mr. Dan Candelaria, PE
City Traffic Engineer
CITY OF GARDEN GROVE
11222 Acacia Parkway
Garden Grove, CA 92840

Subject: Proposal to Provide Engineering Design Services for the City of Garden Grove Fiber Optic Signal Interconnect System, Phase II

Dear Mr. Candelaria:

RBF Consulting (RBF) is pleased to present our proposal to provide professional engineering design services for the City of Garden Grove's Fiber Optic Signal Interconnect Phase II Project. We have thoroughly reviewed the request for proposal (RFP) for the City's Fiber Optic Communication Master Plan, and conducted a project site investigation in order to fully understand the existing traffic signal and signal communication infrastructure, and proposed improvements. With this background information we developed our project understanding, project approach, and work plan in order to provide the City of Garden Grove with the most efficient delivery of professional services within the project schedule.

The project consists of replacing approximately 18.5 miles of existing twisted pair with fiber optic cable, replacing 18 Closed Circuit Television Cameras, upgrading 63 traffic signal controllers, and integrating a new traffic control system to support the new fiber optic/Ethernet system. The City's goal is to bring the benefits of enhanced signal synchronization and operational effectiveness along the project corridors and thereby increasing mobility and reducing travel times.

In order to assist your staff with the most efficient delivery of professional services within the project schedule, the RBF Project Team will implement a management and technical approach that has been successfully used on similar Intelligent Transportation System (ITS) Projects for various public agencies.

It is our belief that the key project issues can be discussed and resolved in the early stage of the project. Therefore, our approach is to present the project in two phases. Phase 1 will be preliminary engineering services and Phase 2 will be final engineering services. The key project issues and recommended solutions will be the key items presented under Phase 1.

Some of the key project issues include the following:

- Finalization of the proposed ITS elements
- Current projects under construction
- CCTV locations
- Project communication topology

14725 Alton Parkway ■ Irvine, CA 92618
Telephone: 949.472.3505 ■ FAX: 949.472.3742

- Conduit/fiber optic cable communication routes
- Pull boxes/splice vaults upgrades
- Other traffic signal and intersection lighting upgrades
- Pedestrian ramps upgrades

We have included a very extensive project understanding and project approach section in our proposal. The Section highlights critical items that are essential during the initial stage of the project. Some of these items include the following:

- Conduct meetings with City of Garden Grove staff to review the existing and proposed communication topology, proposed fiber optic alignment, CCTV locations, and the type of CCTV, fiber optic modems/switches, etc. that will be required in order to provide complete communications between the project corridors and the City of Garden Grove Traffic Management Center.
- Develop a Project ITS Architecture Exhibit that will show existing communication systems and field elements, and proposed and future field elements, in order to understand the necessary improvements and equipment that will be required for this project. In addition, the Project ITS Architecture Exhibit will show the existing communication topology, and a recommended project communication topology that can be integrated to support existing, proposed, and future field elements
- Provide scalable/expandable communication recommendations that will facilitate the City's ITS communication infrastructure to migrate to an Ethernet communication system.

Benefits of the RBF Team

By selecting the RBF Team, the City of Garden Grove will benefit from a highly qualified firm experienced in providing cost-effective solutions to municipalities. Specific benefits derived from selecting the RBF Team for this project include:

- ✓ **Trusted Provider** - Extensive traffic signal, Intelligent Transportation Systems (ITS), and Bus Rapid Transit (BRT) planning and design experience with agencies such as Caltrans, the Cities of Santa Monica, Beverly Hills, Culver City, Pasadena, Torrance, Orange, and Orange County Transportation Authority (OCTA) demonstrates our ability to provide high quality and responsive service for a variety of traffic engineering projects.
- ✓ **Recent Local Experience** - RBF has completed plans specifications and estimates for the City of Garden Grove Fiber Optic Signal Interconnect System, Phase I. The project included approximately 17 miles of fiber optic cable, modems/Ethernet devices, two Dynamic Message Sign (DMS) Systems, 19 Closed Circuit Television (CCTV) Systems, upgrades to the existing TMC and Police Dispatch. In addition, RBF is currently providing construction assistance, and has prepared conceptual plans for the proposed new TMC.
- ✓ **Recent Experience** - RBF has completed plans specifications and estimates for Intelligent Transportation Systems Projects that have included fiber optic communication systems, modems/Ethernet devices, Dynamic Message Sign (DMS) systems, Closed Circuit Television (CCTV) systems, Transit Signal Priority, and traffic signal upgrades for Caltrans and the Cities of Santa Monica, Pasadena, Irvine, Orange, Beverly Hills, Garden Grove, and Culver City.
- ✓ **Local Presence/Familiarity with Project Area** - RBF Consulting is an Orange County headquartered firm located just 24 miles from the City of Garden Grove. The proposed project team is familiar with the City of Garden Grove and surrounding agencies and our proximity will allow close and effective interaction with the City.
- ✓ **Experienced Staff Poised to Deliver Your Program** - A Project Manager and other key personnel that are long-term members of RBF providing consistency in approach, quality and project delivery have been chosen for this project. Mr. Ortiz has a staff of fifteen people that can be assigned to this project in order to meet project delivery. RBF is a multi-discipline firm with the capacity to augment staff as required to meet the City's scheduling needs.

Selection of RBF will provide your staff with an experienced and familiar design team to assist in delivering these important services to your community.

RBF, and most importantly our proposed **Project Manager, Mr. Carlos Ortiz, PE, TE, PTOE** has a proven record of successfully providing traffic signal, and ITS planning and design services. He will lead and implement the City's important program while working closely with your staff to ensure successful, cost effective and timely delivery of this very important program. Mr. Ortiz will also provide a high level of client service and communication.

RBF appreciates the opportunity to submit this proposal and looks forward to discussing our qualifications with the City of Garden Grove in greater detail. Please feel free to contact me at (949) 855-3657 or cortiz@rbf.com.

Sincerely,

Carlos A. Ortiz, PE, TE, PTOE
Project Manager
Vice President / Public Works and Traffic Engineering
cortiz@rbf.com

Steven J. Huff
Senior Vice President
Public Works/Transportation
sjhuff@rbf.com

Enclosure: Proposal (4 copies)

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 1: Qualifications and Experience

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 1: QUALIFICATIONS AND EXPERIENCE

Year Established:
1944

Firm Address:
14725 Alton Parkway
Irvine, CA 92618

Telephone Number:
949-472-3505

Other Office Locations:
Camarillo, California
Carlsbad, California
Las Vegas, Nevada
Monterey Bay, California
Oakland, California
Ontario, California
Palm Desert, California
Phoenix, Arizona
Sacramento, California
San Diego, California
San Jose, California
Temecula, California
Tucson, Arizona
Walnut Creek, California

Company Profile

RBF Consulting is a full service planning, environmental, engineering design, survey, and construction management firm headquartered in Orange County, California. RBF has worked with local agencies and Caltrans for over 30 years on design reports, supporting environmental documents and plans, specifications and estimates for public improvement projects. The quality of the services we provide our clients is outstanding.

Our thorough understanding of local public agency and Caltrans standards for traffic design, from project planning through construction, ensures the timely and cost-efficient completion of the bidding documents, construction drawings, and cost estimates for the implementation of the Fiber Optic Signal Interconnect System, Phase II Project.

This year marks RBF's 64th year of continuous operation. We have been providing professional services since 1944. The firm is ranked 70th in ENR's Top 500 Design Firms. RBF is a strong, financially stable firm with no bankruptcy, pending litigation, closures or mergers that would impede our ability to complete this traffic improvement program. Through our dedication to client satisfaction, we maintain a consistent healthy growth rate year after year.

As a multi-disciplined full-service firm, RBF provides great advantages to our clients for successful project delivery. RBF's experience in all aspects of project planning and final PS&E for all disciplines (traffic, survey, right of way, roadway, structures, drainage, storm water quality, electrical and landscape) provides for the greatest flexibility in resource scheduling to avoid schedule delays; efficient subconsultant oversight; cohesive quality control processes; and more effective project delivery.

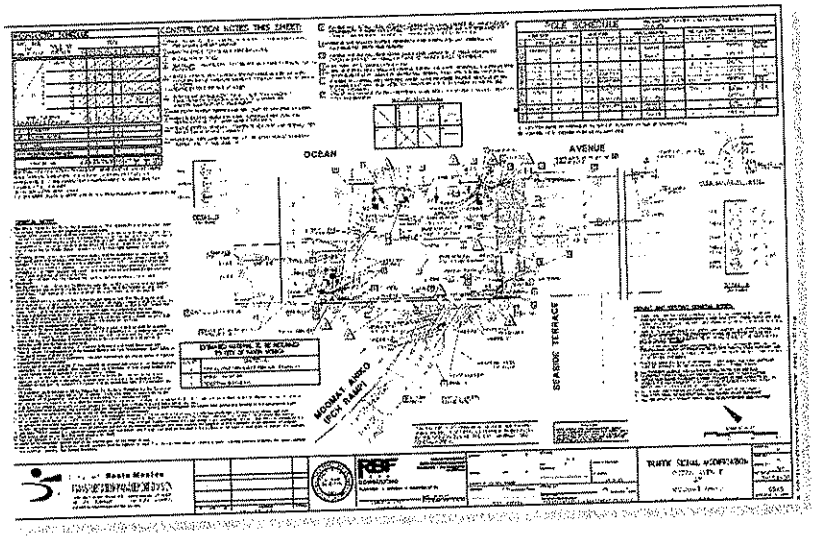
Traffic Engineering

RBF provides a wide range of traffic engineering design services to numerous public agencies and private developers throughout California. Many of RBF's experienced staff of Registered Traffic Engineers, Registered Civil Engineers, and designers have had the benefit of long careers at RBF and have worked with several public agencies during their tenure at RBF. Their background and experience has proven invaluable in the early identification of the needs of each of our public agency clients and created the ability for RBF to respond with the appropriate level of detail and cost saving design solutions. RBF's staff maintains an ongoing dialogue with local, regional, and state jurisdictional agencies and continually keeps abreast of changing technology through active participation, including board positions, in various industry organizations such as the Institute of Transportation Engineers (ITE), ITS America, and Orange County Traffic Engineering Council (OCTEC).

RBF's Traffic Engineering Department has an outstanding reputation in the field of traffic engineering. Members of the firm have extensive project experience working directly for municipal, county, and state agencies, as well as providing consulting services to private clients. Major traffic consulting services provided include:

Traffic Signal Design Services

Traffic signal design for various agencies and private developers is one of RBF's primary services, resulting in an average of 100 or more individual traffic signal intersection designs annually. In the last 20 years, an estimated 2,300 signals and over 500 signal communication systems have been designed by RBF.

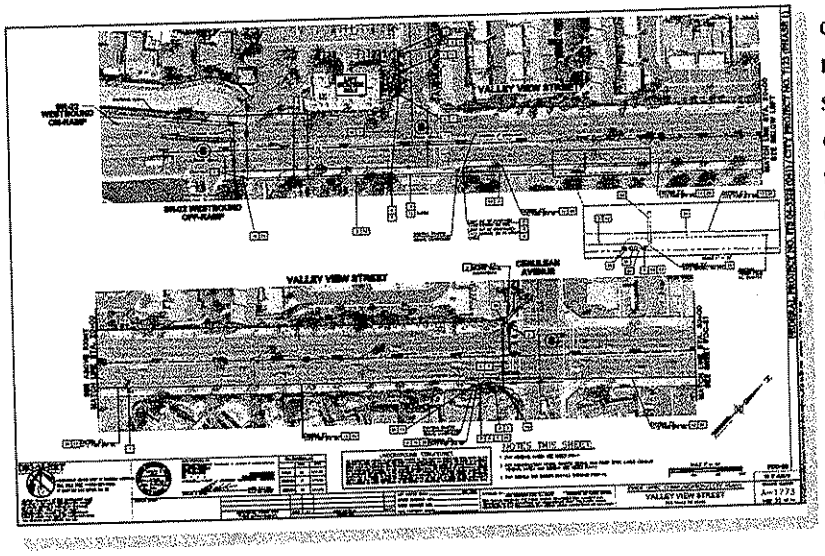


RBF has designed traffic signal systems for many agencies in Southern California including Orange, Irvine, Anaheim, San Clemente, Mission Viejo, Newport Beach, Santa Monica, Beverly Hills, Pasadena, Culver City, Torrance, and Long Beach. RBF staff is knowledgeable of the different controller systems used throughout Southern California. These include:

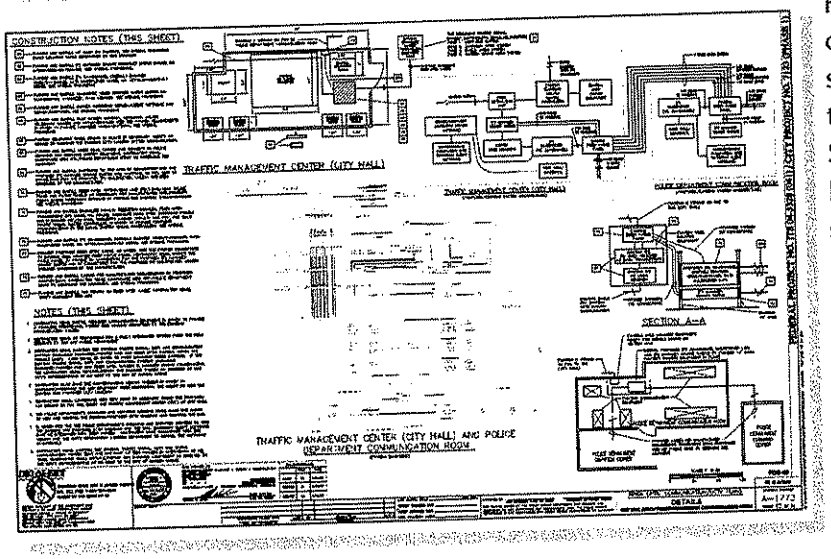
- NEMA controllers
- 170 controllers
- 2070 controllers

Intelligent Transportation System (ITS) Services

RBF provides ITS services to many agencies throughout Southern California. ITS services include legacy/Ethernet communication systems (hardwired, fiber optic, hybrid, and wireless), closed circuit television (CCTV) systems, dynamic message signs (DMS), ramp metering systems, traffic monitor stations/system detection stations, and installation or upgrades of traffic management centers (TMC).

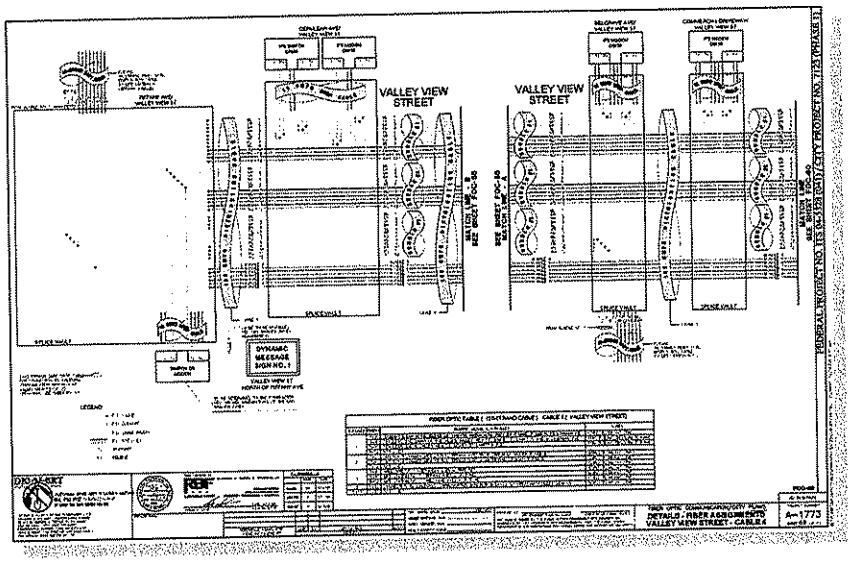


RBF has designed CCTV, DMS, System Detection and fiber optic communication systems for many agencies in Southern California Garden Grove, Irvine, Orange, Buena Park, Santa Monica, Beverly Hills, Pasadena, Culver City, and Caltrans.

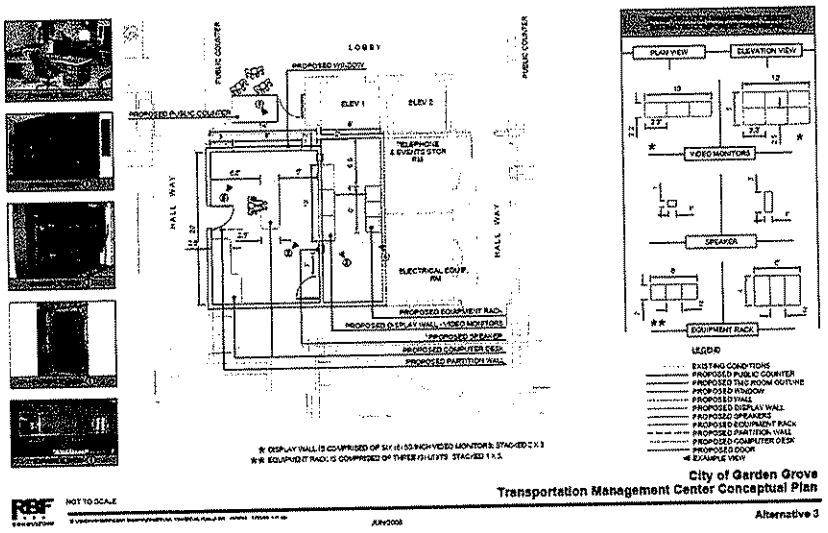


Recently, RBF completed fiber optic communication plans, technical specifications and engineer's estimates for the City of Garden Grove Fiber Optic Signal Interconnect and Amber Alert Project that included installation of seventeen (17) miles of fiber optic communication system along major corridors, nineteen (19) Closed Circuit Television Cameras (CCTV) and two Dynamic Message Signs (DMS) with Amber Alert capabilities that will link approximately 22 traffic signals and other field elements to the City's TMC via the

City's Traffic Department communication network and it will provide a communication link to the Police Dispatch in order to disseminate messages to the DMS and have capabilities to view/control the CCTV cameras.



CCTV and fiber optic details were included showing specific hardware and how the systems are link at the field elements and at the TMC and Police Department. Fiber optic assignment detail sheets were included showing the specific architecture of the fiber optic system.



As part of this project, extensive field work was conducted by our experienced traffic engineers to verify the existing communication system including conduit alignment, conduit sizes, conduit sweeps, vaults, pull boxes, controller cabinets, and communication system inside City Hall.

In addition, RBF is currently providing construction assistance services and is currently assisting the City of Garden Grove with the planning of their new Traffic Management Center.

ADDITIONAL TRAFFIC ENGINEERING SERVICES

RBF provides additional Traffic Engineering Services to public agencies and private clients throughout Southern California, including:

- Traffic Signal Timing and Coordination Services
- Traffic Signal Timing Implementation Services
- Signing and Striping Services
- Lighting Systems
- Stage Construction/Traffic Handling
- Agency Permitting
- Contract Administration; Construction Inspection and
- Construction Management

RBF has prepared various types of traffic studies for local agencies and private clients. RBF utilizes Caltrans, local agencies, Institute of Transportation Engineers (ITE), California Vehicle Code and industry policies and standards for the evaluation and analysis of intersection and roadway systems and the preparation of the specific traffic engineering studies. Specific traffic engineering studies include:

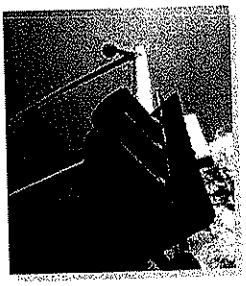
- Traffic Impact Analysis
- Before and After Travel Demand
- Circulation Analysis
- Parking Analysis
- Engineering and Speed Survey
- Lane Storage Analysis
- Traffic Signal Warrants
- Traffic Signal Communication Master Plan

FAMILIARITY WITH CITY, COUNTY, STATE AND FEDERAL REQUIREMENTS

RBF has extensive experience in completing and processing the numerous federal funding authorization forms through the Caltrans District Local Assistance Engineer and the Federal Highway Administration, as well as incorporating all required special provisions in the project specifications to ensure that federal funding is not jeopardized. RBF has developed a comprehensive table summarizing the various authorization forms required in a matrix format that can be used to clearly identify the steps to be followed and the responsible parties.

For any proposed work that will directly impact state highway facilities and require a Caltrans encroachment permit, RBF's extensive track record working with Caltrans on numerous state highway projects will help facilitate the process. RBF's staff maintains an on-going dialogue with local, regional, and state jurisdictional agencies and continually keeps abreast of the changing requirements and procedures of the Federal, State and local agencies. For several years, RBF has participated on various Caltrans District and Headquarters Professional Liaison committees, which promotes an effective communication exchange between Caltrans, cities, counties, transportation authorities and consultants.

Representative Projects / References



RBF has provided similar services to many agencies throughout California. Our team has prepared ITS communication master plans and design for various types of communication systems including hardwired, fiber optic, microwave, wireless systems and traffic signals. In addition, RBF has provided design services for CCTV systems, Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), Red-Light Photo Enforcement Systems, and installation and upgrades of Traffic Management Centers (TMC) and workstations. Recently, RBF has provided ITS services for the following agencies in Southern California:

ITS SERVICES FOR SOUTHERN CALIFORNIA AGENCEIS		
City of Garden Grove City of Beverly Hills City of Santa Monica City of Pasadena	City of Culver City City of Torrance City of Orange City of Irvine	City of Santa Ana City of Buena Park City of Simi Valley Caltrans

The following pages detail our recent and relevant experience as well as client references.

Fiber Optic Signal Interconnect and Amber Alert System
Garden Grove, CA

Highlights:

- 17 Miles of Fiber Optic Interconnect System
- Installation of Closed Circuit Television Camera Systems (CCTV) at 19 Locations
- Development of the Project Master Plan/System Architecture
- Provide Fiber Optic Communication to Two (2) Proposed Dynamic Message Signs (DMS) with Amber Alert Capabilities
- Plans, Specifications and Engineering Estimates (PS&E)

Reference:

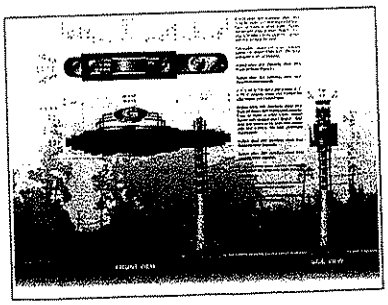
City of Garden Grove
11222 Acacia Parkway
Garden Grove, CA 92840
Dai Vu, PE
714/741-5189

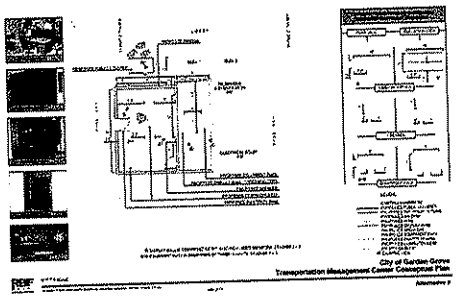
The City of Garden Grove will be expanding their Intelligent Transportation System (ITS) in order to facilitate the communications from the signalized intersections and corridors to the City's Traffic Management Center (TMC) and Police Dispatch. The proposed system will provide real time information to the City and the City will be able to manage traffic operations from the TMC.

The project consists of installing seventeen (17) miles of fiber optic communication system along major corridors, nineteen (19) Closed Circuit Television Cameras (CCTV) and two Dynamic Message Signs (DMS) with Amber Alert capabilities that will link approximately 22 traffic signals and other field elements to the City's TMC via the City's Traffic Department communication network. In addition, providing a communication link to the Police Dispatch in order to disseminate messages to the DMS and have capabilities to view/control the CCTV cameras. The scope of work for this project expanded to include fiber optic drops at the City's Public Works Yard and 5 water facilities (well site, booster stations and lift stations per the City's Water Department request) for future fiber optic communications needs.

The objective of this project is to evaluate and design the CCTV/DMS Systems and to evaluate and design fiber optic communication lines connecting the field elements with the City's TMC in order to allow management of each system. The proposed Systems should satisfy current and future needs based on the City's requirements.

RBF is responsible for the development of the project master plan/system architecture and the preparation of plans, specifications and engineering estimates (PS&E) for design of the fiber optic signal interconnect systems, CCTV systems and DMS systems. The City's goal is to install the new fiber optic communication system while maintaining the existing hardwired communication system as an interim condition.





SR-22 / I-405 West County Connectors ITS
Orange County, CA

Highlights:

- Caltrans District 12 1st Ethernet Communication System
- 5 Miles of Fiber Optic Interconnect System
- Installation / Relocation of Closed Circuit Television Camera Systems (CCTV) at 4 Locations
- Installation of DMS at 2 Locations
- Modification of Ramp Metering Systems and Traffic Monitoring Systems
- Installation of Communication Equipment at 3 Hubs and TMC
- Plans, Specifications and Engineering Estimates (PS&E)

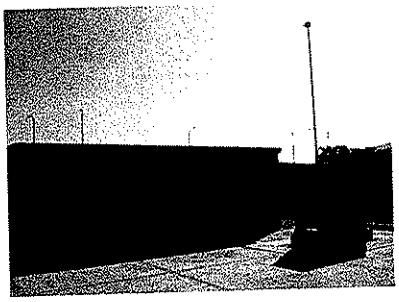
Reference:
Caltrans District 12 TMC
6681 Marine Way, Irvine, CA 92618
Henry Pham, PE
949/936-3464

As part of the SR-22 / I-405 High Occupancy Vehicle (HOV) West County Connectors, RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system.

The project consist of installing an Ethernet fiber optic communication system that will be link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC).

In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for the installation / relocation / modification of CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS).

In addition, temporary plans and details, technical specifications, and engineer's estimates will be provided to maintain the existing CCTV systems, ramp metering systems, traffic monitoring stations, and Dynamic Message Signs (DMS) in operations during the improvements of the I-405 and SR-22 freeways and interchanges. It is anticipated that the construction period will be approximately four years.



Ocean Avenue and 2nd Street Fiber Optic and CCTV Communication Project
Santa Monica, CA

Highlights:

- Installation of a Fiber Optic Communication System to Coordinate 10 Intersections
- Dual Ring Communication Topology
- CCTV at 3 Locations
- Major Traffic Signal Upgrades at 7 Intersections

Reference:

City of Santa Monica
1685 Main Street
Santa Monica, CA 90401
Mr. Andrew Maximous
310/458-4982

This project consists of installing a fiber optic communication system to coordinate ten signalized intersections along Ocean Avenue between Pico Boulevard and California Avenue, and installing Closed Circuit Television camera systems (CCTV) at three locations to provide the City of Santa Monica with the capability to observe traffic operations. RBF is providing plans, specifications and estimates (PS&E) for the fiber optic communication system, CCTV systems, traffic signal and intersection lighting modifications.

The proposed signal fiber optic communication system will use Ethernet communication technology and will connect field elements to the existing Traffic Management Center (TMC) in City Hall. The project also consists of major traffic signal upgrades at seven intersections along the Ocean Avenue Corridor. Major traffic signal upgrades include loop detector relocation, pole equipment upgrades, intersection rewiring, and the addition of video detection.

Santa Monica Boulevard Fiber Optic Communication Project
Santa Monica, CA

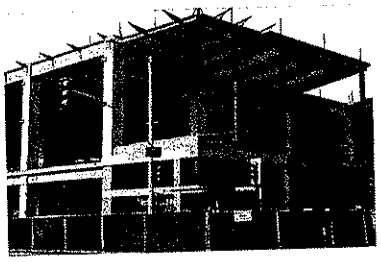
Highlights:

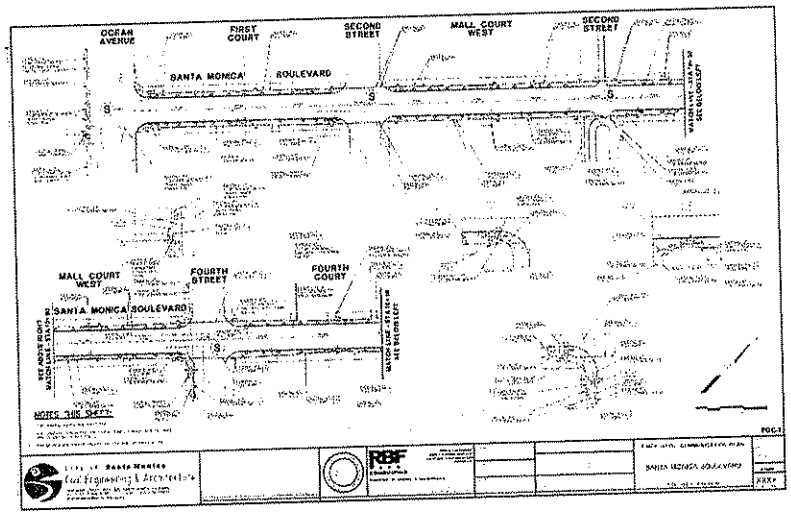
- Approximately One-Half Mile of Fiber Optic Signal Communications
- Major Traffic Signal Upgrades

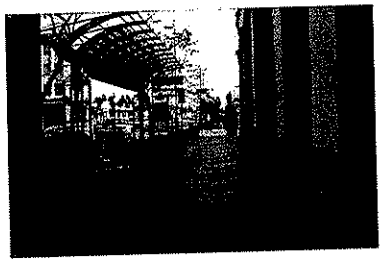
Reference:

City of Santa Monica
1685 Main Street
Santa Monica, CA 90401
Mr. Andrew Maximous
310/458-4982

This project consists of installing approximately one-half mile of fiber optic signal communications in existing/proposed conduit along Santa Monica Boulevard from Ocean Avenue to Lincoln Street. The fiber optic communication system will link eight traffic signals and intertie with the future fiber optic signal communication backbone along Ocean Avenue. The fiber optic signal communication system will provide the City of Santa Monica with the capability to observe traffic operations and manage their traffic signals and other field elements from the City's Traffic Management Center (TMC) via the City's Traffic Department fiber optic communication network. RBF is providing plans, specifications and estimates (PS&E) for the fiber optic communication system, and traffic signal and intersection lighting modifications. The proposed signal fiber optic communication system will use Ethernet communication technology. The project also consists of major traffic signal upgrades at the intersections of Santa Monica Boulevard/6th Street, Santa Monica Boulevard/7th Street, and 26th Street/Pennsylvania Avenue.







City of Anaheim On-Call Traffic Engineering Services
Anaheim, CA

Highlights:

- New Traffic Signal Plans
- Traffic Signal Modification Plans
- Fiber Optic and Hardwired Signal Communication Plans
- CCTV Systems
- SCOOT Systems
- Signing and Striping Plans

Reference:
City of Anaheim
200 S. Anaheim Boulevard
Anaheim, CA 92805
Mr. Jalai Taher, 714/765-5183

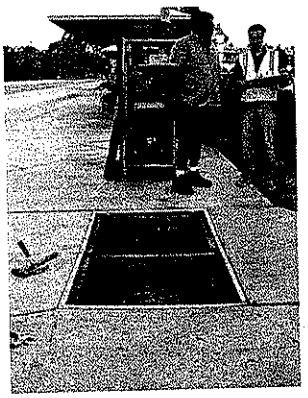
As part of the City of Anaheim "On-Call" Traffic Engineering Services, RBF has prepared traffic signal, signal communication plans, Split Cycle Offset Optimization Technique (SCOOT) plans, and signing and striping plans for various locations throughout the City. Specific projects included:

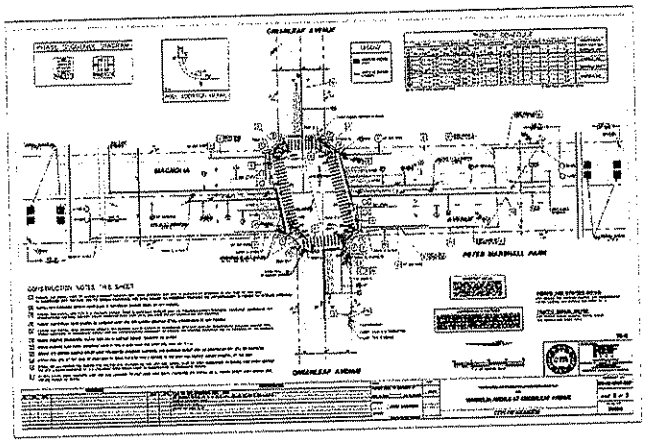
Magnolia Avenue at Greenleaf Avenue Traffic Signal Improvements - Preparation of plans and engineer's construction estimates for signing and striping improvements, the removal of an existing pedestrian traffic signal and the installation of a new traffic signal system at the intersection of Magnolia Avenue at Greenleaf Avenue.

Brookhurst Street at Brookmore Avenue Traffic Signal Improvements - Preparation of plans and engineer's construction estimates for signing and striping improvements, and the installation of a new traffic signal system at the intersection of Brookhurst Street at Brookmore Avenue.

Western Avenue at Faircrest Drive and Serrano Avenue at Canyon Crest / Wildflower Lane Traffic Signal Improvements - Preparation of plans and engineer's construction estimates for signing and striping improvements, the installation of a new traffic signal system at the intersection of Western Avenue at Faircrest Drive, and the modification of the traffic signal system at the intersection of Serrano Avenue at Canyon Crest/Wildflower Lane.

Lincoln Avenue from West City Limits to Brookhurst Street Traffic Signal Improvements - Preparation of plans and engineer's construction estimates for, SCOOT systems at eight intersections, fiber optic and hardwired communication system, CCTV system, traffic signal controller upgrades, and traffic signal modifications.





City of Orange Fiber Optic Interconnect and Closed Circuit Television (CCTV) Camera Surveillance System Project Orange, CA

Highlights:

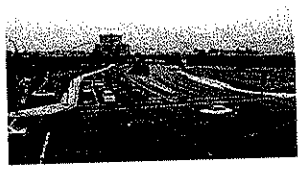
- 11 Miles of Fiber Optic Interconnect and Hardwired Interconnect System
- Installation of Closed Circuit Television Camera Systems (CCTV) at 17 Locations
- Plans, Specifications and Engineering Estimates (PS&E)

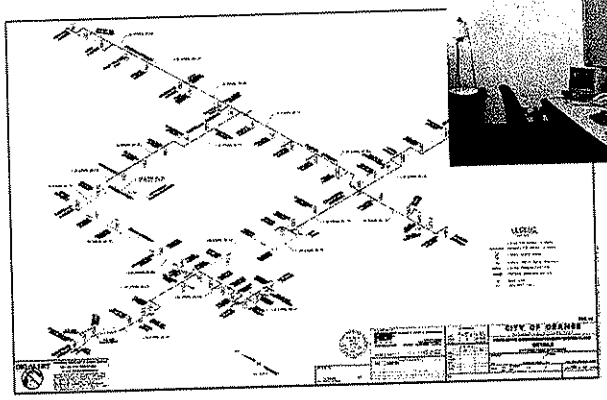
Reference:

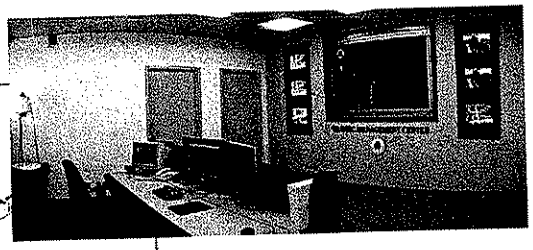
City of Orange
300 East Chapman Avenue
Orange, CA 92866
Amir Farahani
714/744-5566

The City of Orange expanded its Intelligent Transportation System (ITS) in order to facilitate communications from signalized intersections and corridors to the City's Traffic Management Center (TMC). The system provides real time information to the City and it's able to manage traffic operations from the TMC. This project consisted of the installation of eleven miles of fiber optic interconnect system and hardwired interconnect system to coordinate the signalized intersections along Katella Avenue, Tustin Street, Main Street and La Veta Avenue in the City of Orange. The project also involved the installation of Closed Circuit Television camera systems (CCTV) at seventeen locations to provide the City of Orange with the capability to observe traffic operations that will link all traffic signals and other field elements to the City's Traffic Management Center (TMC) via the City's Traffic Department communication network.

RBF was responsible for preparation of plans, specifications and engineering estimates (PS&E) for design of the traffic signal fiber optic communication system and CCTV systems. The City's goal is to have a communication system that will assist them in managing the traffic at selected intersections and roadway segments; enhance staff efficiency through remote monitoring, troubleshooting, and system adjustments; and compliment the City's existing traffic signal surveillance, control, and monitoring program. Also, the City's goal is to have a traffic management system that will allow communication between its existing signal controllers and provide a communication link between the City's TMC and Caltrans District 12 TMC.







Video Surveillance Integration Gap Closure Project
Culver City, CA

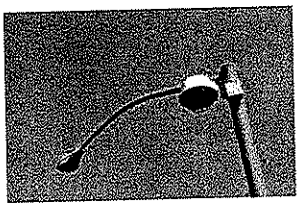
Highlights:

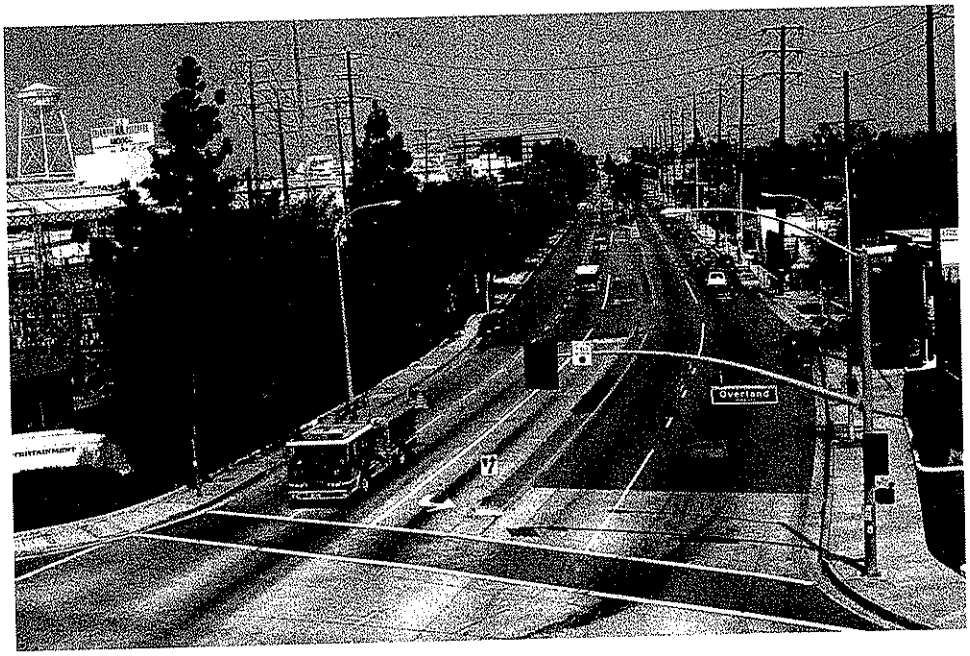
- CCTV at 11 Intersections
- Five miles of Fiber Optic Communication
- Public Works Facility Work Station
- Plans, Specifications and Engineering Estimates (PS&E)

Reference:

City of Culver City
9770 Culver Boulevard
Culver City, CA 90230
Mr. Gabe Garcia
310/253-5633

This project consisted of the installation of Closed Circuit Television (CCTV) system at eleven (11) signalized intersections along Jefferson Boulevard, Culver Boulevard, Washington Boulevard and Sepulveda Boulevard to provide the City of Culver City the capability to observe traffic operations and expand their ITS system architecture. The project also included installation of a 48-strand single mode fiber optic communication system to link the CCTV systems to the City Hall Hub and the Maintenance Yard. The project further included a CCTV workstation at the maintenance yard. RBF was responsible for preparation of plans, specifications and engineering estimates (PS&E) for the design of the CCTV systems, fiber optic communication system, and the CCTV workstation at the City's Maintenance Yard.





Citywide Traffic Control and Transit Signal Priority System Beverly Hills, CA

Highlights:

- Traffic Signal Modification Plans
- Traffic Signal Equipment to provide Transit Signal Priority to MTA Bus Rapid Transit System

Reference:
City of Beverly Hills
345 Foothill Road
Beverly Hills, CA 90210-3713
Mr. Bijan Vaziri, Traffic Engineer, 310/285-2556

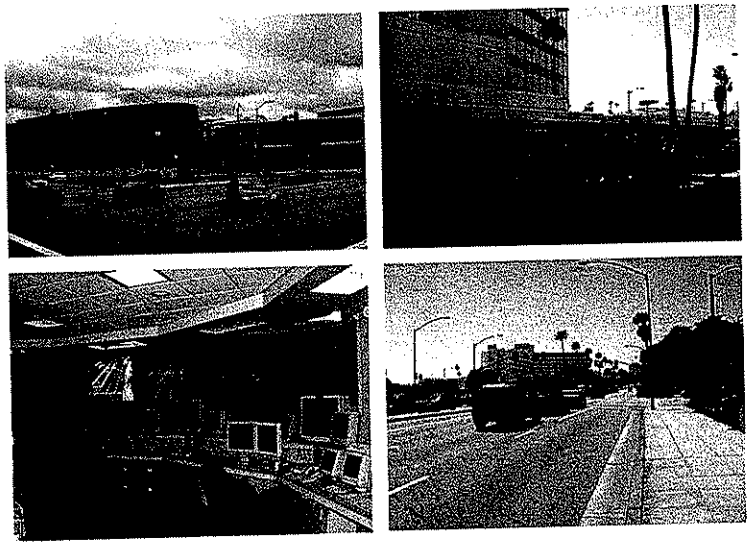
RBF provided Traffic Engineering Services to the City of Beverly Hills for the design and development of City-wide Traffic Control and Transit Signal Priority System. RBF was primarily responsible in the development of plans, technical specifications and engineer's estimates (PS&E) for the following major corridors in the City of Beverly Hills. These are:

- Wilshire Boulevard
- Olympic Boulevard

RBF developed traffic signal and intersection lighting modification PS&E for twenty-seven (27) signalized intersections along these two corridors. The plans were designed to include new 2070 traffic signal controllers and the installation of special loop detectors (MTA loop detectors) that will be used as part of Metropolitan Transportation Authority (MTA) Bus Rapid Transit (BRT) System.

The project included linking the city's new Traffic Control System with the City of Los Angeles ATSAC to support the Transit Signal Priority System.

The project was funded by MTA.



Lexington Road and Burton Way Traffic Signal Improvements Beverly Hills, CA

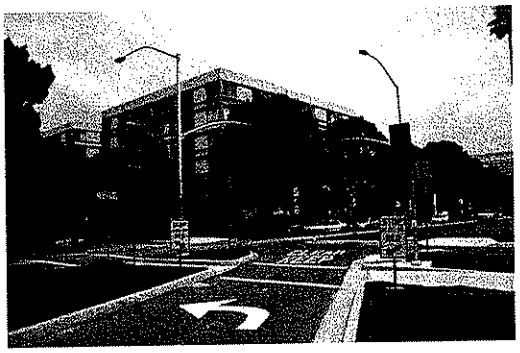
Highlights:

- Traffic Signal Systems
- Traffic Signal Interconnect System
- CCTV System
- Roadway Improvements
- Signing and Striping Improvements
- Survey and Staking Services

Reference:
City of Beverly Hills
345 Foothill Road
Beverly Hills, CA 90210-3713
Mr. Bijan Vaziri, Traffic Engineer, 310/285-2556

Since 1992, the City of Irvine has been working to develop an Integrated Traffic Management System with interties to Caltrans, the University of California, Irvine and the City of Santa Ana. The City has deployed 65 CCTV cameras, eight (8) video detection systems, and six (6) changeable message signs, which are controlled from the City's traffic management center (ITRAC). In an effort to keep pace with the evolving communications and ITS industry, City staff and RBF conducted a detailed evaluation of their Advanced Traffic Management System and Communications Infrastructure focusing on four key areas: central traffic control system; traffic signal controller technology; communications infrastructure and topology; and ATM and Ethernet backbone data transport.

This study included an evaluation of the existing system's worth and forecast costs for the planned improvements. The study focuses on generating long-range forecasts for maintaining and rehabilitating the traffic signal system. One of the issues faced is the technical capability of contract staff to support the advanced equipment deployed in the City of Irvine. The City relies on fast, uninterrupted communications. The City explored several data transport modes, which has led to the deployment of ATM technology to communicate between data nodes through a mesh network.



Long-term plans include the integration of video and data onto an Ethernet backbone to transmit information in a digital format. The City identified an 18-month program for implementing, testing and evaluating potential central traffic control systems based on benefits and deficiencies of the existing VMS system.

Through the implementation of the new traffic signal control system and controller technology, the City is faced with the challenge of maintaining their legacy system. The City is in the process of evaluating the communications infrastructure and topology to allow for simultaneous communications of the two systems during migration.

Traffic Management System Operations Study
Irvine, CA

Highlights:

- Central Traffic Control System
- Traffic Signal Controller Technology
- Communications Infrastructure and Topology
- ATM and Ethernet Backbone Data Transport

Reference:
City of Irvine
One Civic Center Plaza
Irvine, CA 92623-9575
Mr. Ken Louie, 949/724-7645

Since 1992, the City of Irvine has been working to develop an Integrated Traffic Management System with interties to Caltrans, the University of California, Irvine and the City of Santa Ana. The City has deployed 65 CCTV cameras, eight (8) video detection systems, and six (6) changeable message signs, which are controlled from the City's traffic management center (ITRAC). In an effort to keep pace with the evolving communications and ITS industry, City staff and RBF conducted a detailed evaluation of their Advanced Traffic Management System and Communications Infrastructure focusing on four key areas: central traffic control system; traffic signal controller technology; communications infrastructure and topology; and ATM and Ethernet backbone data transport.

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Experience Matrix

To provide a concise overview of the RBF Project Team qualifications, we have prepared the following matrix outlining similar current projects and recently completed projects and their associated elements of work.

PROVEN EXPERIENCE FOR EVERY MAJOR PROJECT ELEMENT	Traffic Engineering Services	Project System Architecture	ITS Services	Traffic Signal Design	Signal Communication Systems	CCTV / DMS / TMS Systems	TMC / Work Station Systems	Ethernet Network	Caltrans Coordination / Approval	Project Management / Administrative	Construction Support
CITY OF ORANGE Fiber Optic Interconnect and CCTV Camera Surveillance System Project	✓	✓	✓		✓	✓	✓	✓	✓	✓	
CITY OF SANTA MONICA Ocean Avenue and 2nd Street Fiber Optic and CCTV Communication Project	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
CITY OF CULVER CITY Video Surveillance Integration Gap Closure Project	✓		✓		✓	✓	✓	✓		✓	✓
CITY OF GARDEN GROVE Fiber Optic Signal Interconnect and Amber Alert Project	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
CITY OF PASADENA ITS Fiber Optic, DMS and CCTV Project	✓		✓	✓	✓	✓		✓	✓		
CITY OF SANTA MONICA Santa Monica Boulevard Fiber Optic Communication Project	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
OCTA SR-22 / I-405 WEST COUNTY CONNECTORS ITS	✓		✓	✓	✓	✓	✓	✓	✓		
CITY OF IRVINE Traffic Management Systems Operations Study (TMSOS)	✓	✓	✓	✓	✓	✓	✓	✓			
CITY OF BEVERLY HILLS Citywide Traffic Control and Transit Signal Priority System	✓			✓	✓		✓				
CITY OF ANAHEIM City of Anaheim On-Call Traffic Engineering Services	✓		✓	✓	✓	✓					

Experience gained from these projects will enable our Team to perform a cost effective design within the project schedule. Our ability to manage and complete each project on, or ahead of schedule, and within, or under budget, is the foundation of our success.

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 2: Project Team

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 2: PROJECT TEAM

Project Organization

Benefits of the RBF Team:

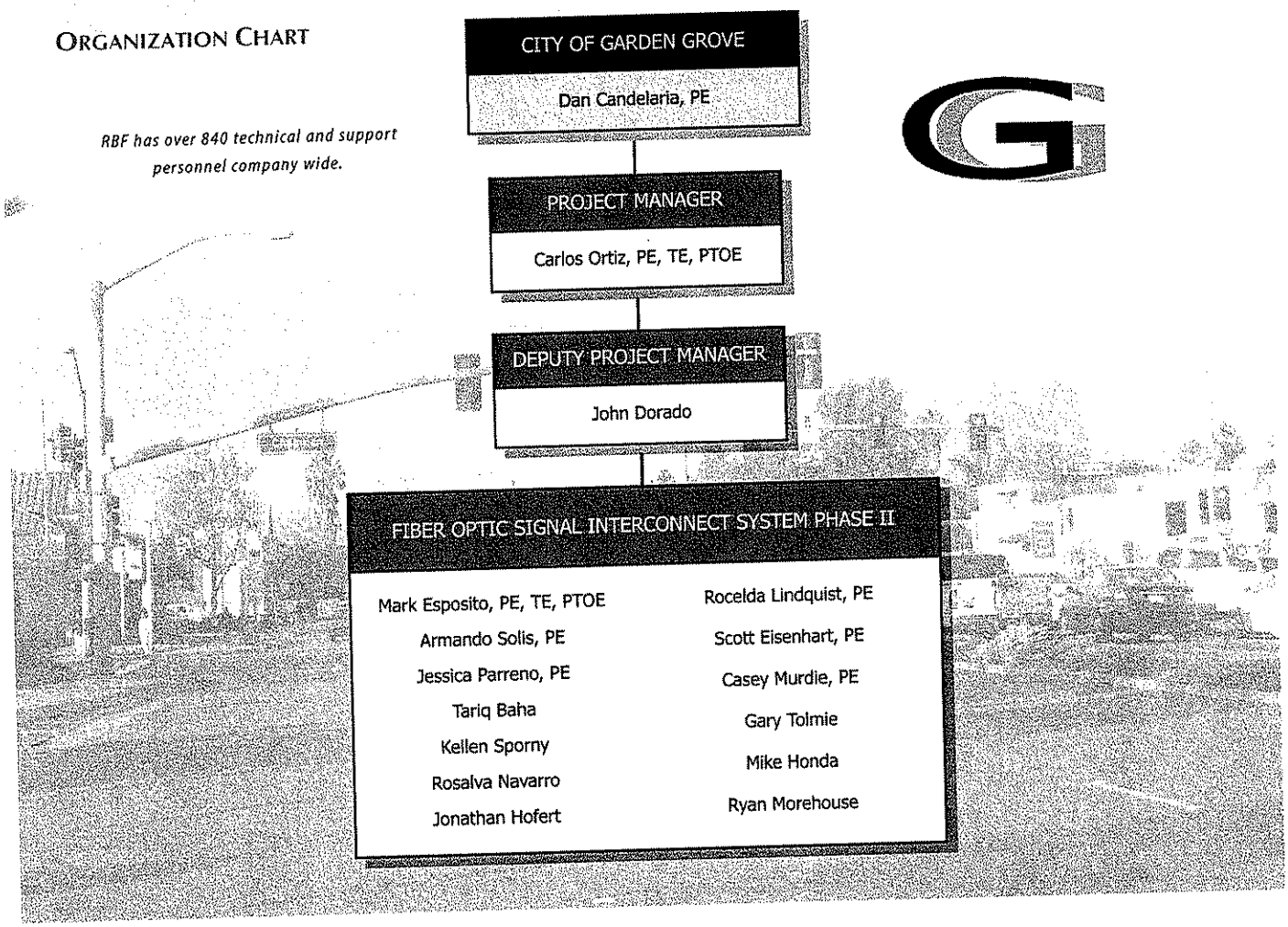
- Recent Experience
- Experienced Staff Poised to Deliver Your Program

The RBF Project Team is pleased to present a team of highly qualified professionals to provide the City of Garden Grove with engineering design services for the Fiber Optic Signal Interconnect System Phase II Project.

The RBF Project Team commits its personnel and resources for the duration of the project to successfully serve the City of Garden Grove.

ORGANIZATION CHART

RBF has over 840 technical and support personnel company wide.



Our proposed Project Team has extensive experience executing work programs that are similar to the proposed project. The key personnel assigned to the City's project have the requisite experience and have functioned in similar responsible positions.

Our key personnel and some of our support staff are very familiar with the City of Garden Grove signal communication system. They designed the City of Garden Grove Fiber Optic Signal Interconnect System Phase I Project. The project consisted of 17 miles of fiber optic cable, 19 Closed Circuit Television Systems, 2 Dynamic Message Signs (DMS) Systems, and upgrades to the existing TMC and Police Dispatch.

Key to maintaining a project schedule is assignment of permanent and local staff that has the appropriate level of availability to commit to their respective roles. RBF's proposed key personnel and support staff are available to fulfill their time commitments in accordance with the project schedule. RBF understands that a project's success depends upon quality key personnel being available to our clients. Our proposed key personnel will remain in their designated positions for the duration of your projects. RBF takes great pride in our track record for maintaining our staff in their designated positions for the duration of the project.

RBF recognizes that the successful delivery of a high quality transportation improvement project starts with assigning a Project Manager that possesses superior technical, management and leadership skills. **Mr. Carlos Ortiz, PE, TE, PTOE** will serve as your **Project Manager**. All work completed on this Project will be under the direction of Mr. Ortiz.

As Project Manager, Mr. Ortiz will be the single point of contact and will direct the personnel and resources necessary to successfully complete the project. For an efficient execution of this project we have assigned Mr. John Dorado as our key Task Leader to assist Mr. Ortiz throughout the project. Mr. John Dorado can also serve as the Alternate Project Manager. Mr. John Dorado and Mr. Ortiz played the same role for the City of Garden Grove Fiber Optic Signal Interconnect System, Phase I Project that's currently under construction.

Carlos Ortiz, PE, TE, PTOE

Registration:
1997, Civil Engineer, CA, C057535
1999, Traffic Engineer, CA, 2025
1999, Civil Engineer, AZ, 34333
1999, Professional Traffic Operations Engineer, US, 426

Years of Experience: 19

Years with RBF: 16

Education:
B.S., 1989, Civil Engineering, California State Polytechnic University, Pomona

Mr. Ortiz oversees the RBF Traffic Group. With a "hands-on" approach and continuous accessibility to our staff as well as the City of Garden Grove, Mr. Ortiz will facilitate the commitment of staff resources and provide quality assurance oversight for the work program.

Additionally, Mr. Ortiz will be available at all times to the City of Garden Grove and will attend meetings on short notices (one day) as directed by the City.

"I am personally committed to providing your staff (City of Garden Grove) with the utmost level of service and quality work product."

Carlos Ortiz,
Project Manager

Project Manager

Mr. Ortiz, PE, TE, PTOE has worked on a variety of traffic engineering projects for numerous agencies throughout Southern California. He has worked on many complex projects and has the ability to resolve problems quickly and efficiently by drawing on his 19 years of experience exclusively in the field of traffic engineering.

Mr. Ortiz is the President of the Southern California Section of the Institute of Transportation Engineers (ITE), past President (2001-2002) of the Riverside-San Bernardino Institute of Transportation Engineers, and past President of the Orange County Traffic Engineering Council (OCTEC). His extensive involvement in the industry will bring a great benefit to the City of Garden Grove through his knowledge of signal communication technology applications and advancements, and technologies, as well as established relationships with numerous local and state agency personnel and vendor representatives.

Mr. Ortiz's professional experience includes the planning and design of traffic signals, legacy/Ethernet traffic signal communication systems, in-pavement lighted crosswalk systems, traffic management centers (TMC), closed circuit television (CCTV) systems, dynamic message sign systems (DMS), transit priority system (TSP), red-light camera photo enforcement system, lighting systems, ramp metering systems, traffic surveillance systems, stage construction/traffic handling, and signing and striping. Mr. Ortiz has designed and managed various types of signal communication systems for numerous agencies in southern California.

Mr. Ortiz's signal communication experience includes hardwired, hybrid, fiber optic and wireless communication systems. Mr. Ortiz's recent projects have included the installation of Video Detection Systems and CCTV Systems. Recent project experience includes:

- SR-22/I-405 West County Connectors ITS – OCTA
- Fiber Optic Signal Interconnect and Amber Alert – City of Garden Grove
- Orange County Transportation Authority (OCTA) Bus Rapid Transit (BRT) Program – OCTA
- Design/Develop a City-Wide Traffic Control System and Transit Priority System – City of Beverly Hills
- Ocean Avenue Traffic Signal Upgrades, and Fiber Optic and CCTV Communication Systems – City of Santa Monica

- Santa Monica Boulevard Traffic Signal Upgrades and Fiber Optic Communication System – City of Santa Monica
- Culver City Video Surveillance (CCTV) Integration Gap Closure Project – Culver City
- I-710 ITS (CCTV/DMS/Traffic Signals) Mitigation Improvements – City of Pasadena
- Chapman Avenue, Katella Avenue, Tustin Street, Main Street and La Veta Avenue Fiber Optic and CCTV Communication Systems – City of Orange
- Red-Light Camera Photo Enforcement Systems Various Locations – County of Los Angeles
- Lexington Rd and Burton Way Traffic Signal Improvements - City of Beverly Hills
- Traffic Management System Operations Study (TMSOS) – City of Irvine

JOHN DORADO

Registration:
2003, Engineer-In-Training, CA, 116452

Years of Experience: 9

Years with RBF: 6

Education:
B.S., 1999, Civil Engineering, California State University, Fullerton

DEPUTY PROJECT MANAGER

Mr. John Dorado will serve as our Fiber Optic Communication Infrastructure Improvements Task Leader and Alternate Project Manager. Mr. Dorado will assist Mr. Ortiz in the design and coordination of the proposed communication infrastructure improvements that's included on this project. Mr. Dorado has designed traffic signal systems including legacy/Ethernet communication systems for various agencies. Mr. Dorado was the Project Engineer for the City of Garden Grove Fiber Optic and Amber Alert Project, and the Video Integration Project for the City of Culver City. These projects included traffic signal modifications, design of a fiber optic communication system, video detection systems, and CCTV cameras at various locations throughout the Cities. Mr. Dorado has prepared specifications, cost estimates, and designed various traffic signals, traffic signal modifications, CCTV systems, DMS systems, communication hub upgrades and installations, fiber optic communications, signing and striping, and traffic control plans for various agencies in Southern California. Key projects include:

- SR-22/I-405 West County Connectors ITS – OCTA
- Fiber Optic Signal Interconnect and Amber Alert – City of Garden Grove
- Orange County Transportation Authority (OCTA) Bus Rapid Transit (BRT) Program – OCTA
- Ocean Avenue Traffic Signal Upgrades, and Fiber Optic and CCTV Communication Systems – City of Santa Monica

- Santa Monica Boulevard Traffic Signal Upgrades and Fiber Optic Communication System – City of Santa Monica
- Culver City Video Surveillance (CCTV) Integration Gap Closure Project – Culver City
- Chapman Avenue, Katella Avenue, Tustin Street, Main Street and La Veta Avenue Fiber Optic and CCTV Communication Systems – City of Orange

Personnel Qualifications / Availability Matrix

The matrix below is a summary of RBF's personnel assigned to support Mr. Ortiz, Project Manager, and Mr. John Dorado, Deputy Project Manager. All of our proposed staff are committed for the duration of this project. Detailed resumes are included in the Appendix of this proposal.

NAME/ROLE/ AVAILABILITY	YEARS / EDUCATION / REGISTRATION	SIMILAR PROJECT
Mark Esposito, PE, TE, PTOE Project Engineer Availability 40%	18 years Civil Engineer (CA) Traffic Engineer (CA)	• SR-57 Widening ITS Improvements - OCTA • Signal Communication Design and Signal Timing and Coordination Project – City of Simi Valley
Armando Solis, PE Design Engineer Availability: 70%	9 years Civil Engineering, BS Civil Engineer (CA)	▪ City of Santa Monica - Ocean Avenue and Santa Monica Boulevard Project ▪ City of Simi Valley - Traffic Engineering Design and Signal Timing and Coordination Project
Jessica Parreno, PE Design Engineer Availability: 70%	4 years Civil Engineering, BS Civil Engineer (CA)	▪ City of Simi Valley – Signal Communication Design and Signal Timing and Coordination Project ▪ City of Orange - Chapman Avenue (Santiago Canyon Road) and Jamboree Road (New Traffic Signals/Modifications and Fiber Optic Communication/CCTV Systems)
Tariq Baha Design Engineer Availability: 80%	6 years Civil Engineering, BS	▪ City of Simi Valley – Signal Communication Design and Signal Timing and Coordination Project ▪ City of Garden Grove - Signal Timing and Coordination Project
Kellen Sporny Design Engineer Availability: 80%	4 years Civil Engineering, BS Engineer-In-Training, CA	▪ City of Temecula– Ring Road Traffic Signals, Fiber Optic Communication and CCTV System ▪ City of Irvine – Redhill Drive/Barranca Parkway traffic Signals and Signing and Striping Improvements

NAME/ROLE/ AVAILABILITY	YEARS / EDUCATION / REGISTRATION	SIMILAR PROJECT
Rosalva Navarro Assistant Engineer Availability: 80%	1 year Civil Engineering, BS Engineer-In-Training, CA	▪ City of Garden Grove - Fiber Optic Signal Interconnect and Amber Alert System ▪ City of Santa Monica - Santa Monica Boulevard Fiber Optic Communication Project
Jonathan Hofert Assistant Engineer Availability: 80%	2 years Civil Engineering, BS Engineer-In-Training, CA	▪ City of Indio and Riverside County - Clinton Street / Miles Avenue Widening and Miles Avenue Bridge ▪ Caltrans Transportation Management Center (TMC) Park & Ride Design and Value Analysis
Rocelda Lindquist, PE Design Engineer Availability: 80%	19 years Civil Engineering, BS Civil Engineer (CA)	▪ City of Tustin - Tustin Legacy, Traffic Signals an Signal Communication Improvements ▪ Orange County - Route 1 (PCH) Improvements & Traffic Signal at El Morro School and State Park
Scott Eisenhart, PE Design Engineer Availability: 70%	9 years Civil Engineering, BS Civil Engineer (CA)	▪ County of Riverside – Heritage Plaza Traffic Engineering Services ▪ 3rd Street/ Alameda Boulevard and 4th Street/Alameda Boulevard Traffic Signals
Casey Murdie, PE Design Engineer Availability: 70%	6 years Civil Engineering, BS Civil Engineer (CA)	▪ City of Garden Grove – Fiber Optic Signal Interconnect and Amber Alert System ▪ City of Santa Monica – Ocean Avenue and 2nd Street Fiber Optic and CCTV Communication Project
Gary Tolmie Senior Designer Availability: 90%	38 years	▪ City of Culver City - Video Surveillance Integration Gap Closure Project ▪ City of Santa Monica - Ocean Avenue and 2nd Street
Mike Honda Senior Designer Availability: 90%	30 years Communications Design, BA	▪ Orange County - SR-22/I-405 West County Connectors ITS ▪ City of Torrance – Artesia Boulevard Improvement Project (Traffic Analysis and Traffic Signal Modifications)
Ryan Morehouse Design Technician Availability: 90%	3 years	▪ Orange County - SR-22/I-405 West County Connectors ITS ▪ City of Garden Grove – Fiber Optic Signal Interconnect and Amber Alert System

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 3: Project Understanding / Approach

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 3: PROJECT UNDERSTANDING / APPROACH

Project Understanding

The City of Garden Grove will be upgrading and expanding their Intelligent Transportation System (ITS) in order to facilitate the communications from the signalized intersections and corridors to the City of Garden Grove Traffic Management Center (TMC). The City's goal is to bring the benefits of enhanced signal synchronization and operational effectiveness along the project corridors and thereby increasing mobility and reducing travel times.

The City of Garden Grove is committed to improving traffic circulation and reducing travel delay for the public. As part of their commitment, the City of Garden Grove relies on the use of a variety of ITS technologies and traffic enhancements including Closed Circuit Television (CCTV) Cameras, Dynamic Message Signs (DMS), traffic signal synchronization, and intersection operations enhancements.

The Phased I improvements are currently under construction and consist of providing ITS field elements along the west side of the City and linking the field elements to the City's TMC and Police Dispatch.

The Fiber Optic Signal Interconnect System, Phase II Project is funded as part of Proposition 1B - Traffic Light Synchronization Program (TLSP). It requires compliance with Caltrans Local Assistance.

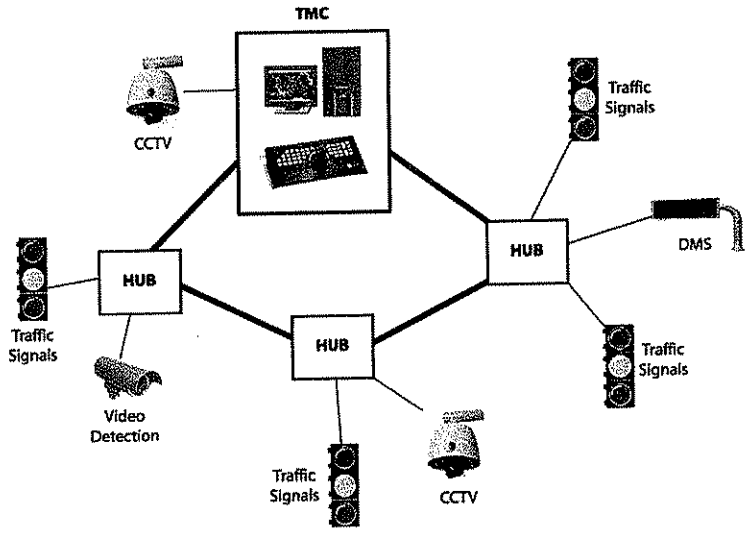
The Fiber Optic Signal Interconnect System, Phase II Project will consist of the following improvements.

- Replacement of approximately 18.5 miles of hardwired cable
- Installation of approximately 18.5 miles of fiber optic cable
- Replacement of obsolete CCTV cameras
- Installation of 18 CCTV cameras
- Upgrading 63 traffic signal controllers
- Installation and integrating a new traffic management system

The proposed improvements will provide two-way data and video communications from the field elements to the TMC. The City's goal is to have a communication system that will assist them in managing the traffic at the intersections and roadway segments; enhance staff efficiency through remote monitoring, provide troubleshooting capabilities, and system

adjustments; and compliment the City's existing traffic signal surveillance, control and monitoring program.

It is very important that the proposed improvements not only provide an effective communication between the field elements and the TMC, but it is highly recommended that the proposed improvements take into consideration future signal/CCTV/DMS communication improvements that will provide minimum disruption to the proposed communication infrastructure. Therefore, the proposed fiber optic communication system should be able to provide communications from the project field elements, and also be expandable and scalable in order to link future field elements along other Corridors.



The selected Consultant will prepare plan, technical specifications, and engineering estimates for implementing the Fiber Optic Signal Interconnect System Phase II Project.

The proposed improvements will require project coordination and permits for agencies where the proposed improvements will encroach within their right-of-way, including, Caltrans, City of Anaheim, City of Westminster, City of Stanton, and Flood Control District.

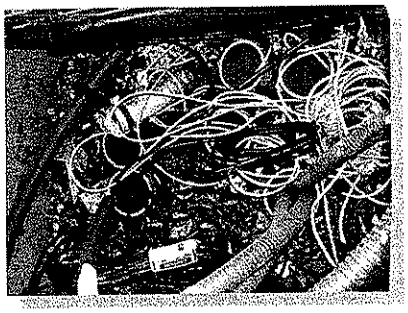
Project Approach

In order to assist the City of Garden Grove with the most efficient delivery of professional services within the project schedule, the RBF Project Team will implement a management and technical approach that has been successfully used on similar ITS Projects for various public agencies. The Project will be presented to the City in two phases. Phase 1 will be preliminary engineering services and Phase 2 will be final engineering services.

Preliminary Engineering (Phase 1)

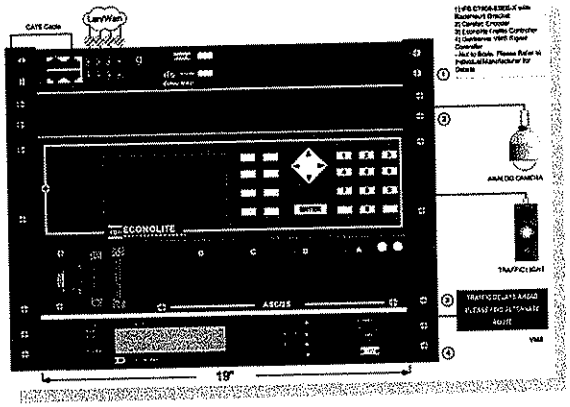
During this phase of the project, all existing reference documentation will be collected from the City of Garden Grove, Caltrans, and other agencies, including improvement plans (street, storm drain system, traffic signals, signal communication, signing/striping, etc.), aerial photographs, right-of-way information and other applicable data. If available, the RBF Project Team will collect aerial and GIS files from the City of Garden Grove. If required, RBF will provide the City with a signed Database License Agreement for the use of City's GIS files.

Experienced traffic engineers will perform an in-depth field analysis to verify and record information. At each signalized intersection and corridor, the RBF Project Team will be collecting the following information:



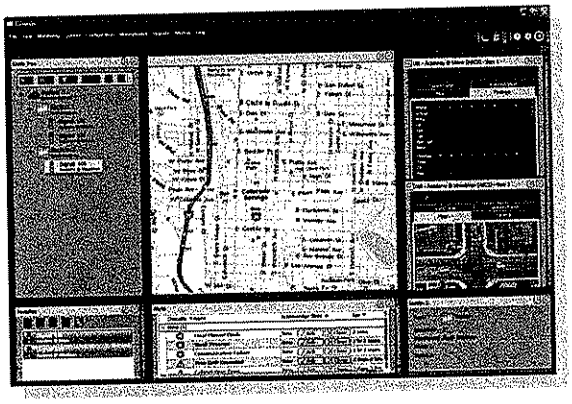
- Roadway improvements (curb, gutter, pedestrian ramps, striping, etc.)
- Existing traffic signal equipment (poles, signal indications, controller cabinet, etc.)
- Exiting signal communication system (fiber optic/hardwired communication system, conduit location/size, pull boxes, vaults, etc.)
- Existing CCTV Systems
- Existing hardscaped/landscaped within the project area
- Existing above ground utilities (fire hydrant, vaults, man-holes, catch basins, etc.)
- Other traffic signal equipment/signs that may require improvements (old sign, dented poles, corroded equipment, etc.)
- Verification of conduit/F.O. alignment along the project corridors
- Existing equipment at the TMC

During this phase, it is critical that the RBF Project Team conduct meetings with City of Garden Grove staff to review the existing and proposed communication topology, proposed fiber optic alignment, CCTV locations, CCTV camera type, fiber optic Ethernet switches, proposed traffic signal controllers, proposed traffic management system, etc. and associated

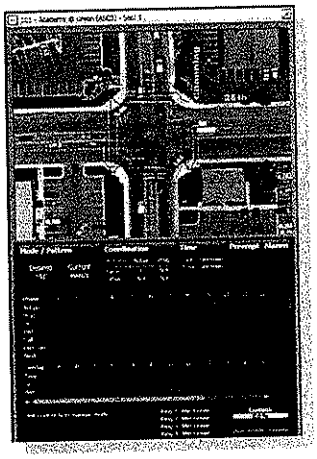


hardware and software that will be required in order to provide complete communications between the field elements and the TMC.

Currently, the City off Garden Grove communicates to the City's signalized intersections via the Econolite Aries traffic management system. As part of this project, the City of Garden Grove wants a new generation traffic management system that can provide full Ethernet capabilities.

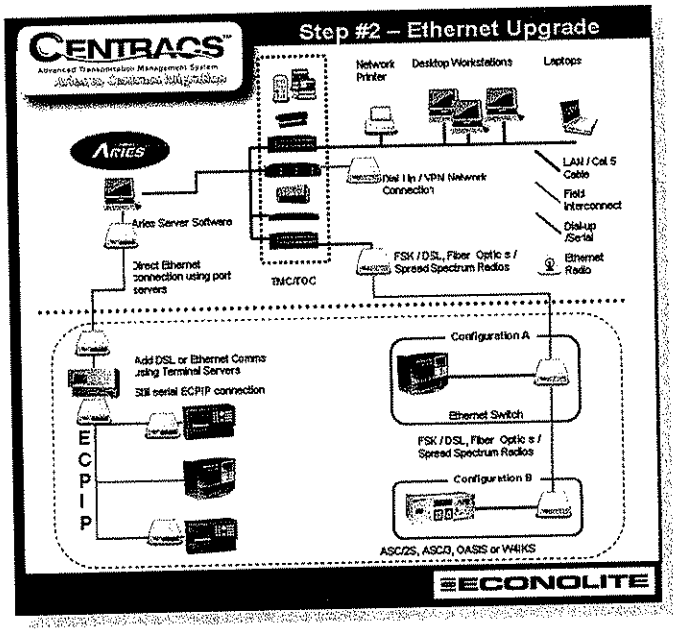


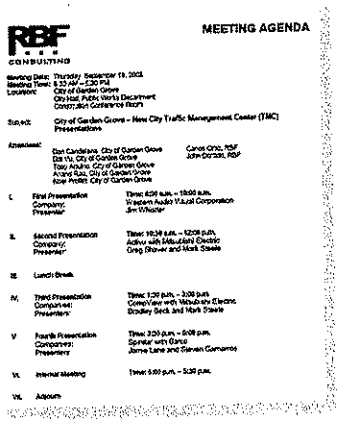
The technology evaluation at the TMC will include the transition from the Econolite Aries traffic management system to the selected traffic management system that can be integrated with minimum disruption to the existing signalized intersections and can be maintained concurrently with the Econolite Aries System and/or the City's signalized intersections that are not part of the project. The goal of the City of Garden Grove is to select an advanced traffic management system that can provide Ethernet communications to the signalized intersections that are part of this project and to maintain communications with the other signalized intersections via the Aries traffic management system.



If necessary, the RBF Project Team will arraign presentations with manufacturers/distributors representatives to present City staff their latest ITS and traffic management system technology including communication hardware and software.

The objective of these meetings is to provide different technologies to facilitate City's decision on a technology that will fit their current and future needs, can effectively communicate with the traveling public, and can provide a highest return of investment.





RBF CONSULTING

MEETING AGENDA

Meeting Date: Thursday, September 19, 2002
Meeting Time: 9:30 AM – 2:30 PM
Location: City of Garden Grove
City Hall, Public Works Department
Conference Room

Subject: City of Garden Grove – New City Traffic Management Center (TMC)
Presentations

Attendees:
Dan Candelaria, City of Garden Grove
Ed Yu, City of Garden Grove
Tom Acuna, City of Garden Grove
Anang Suu, City of Garden Grove
Ken Pettit, City of Garden Grove
Carole Ono, RBF
John Duncan, RBF

I. First Presentation
Company:
Presenter:
Time: 9:00 a.m. – 10:00 a.m.
Western Audio Visual Corporation
Jim Whisler

II. Second Presentation
Company:
Presenter:
Time: 10:30 a.m. – 12:00 p.m.
Activu with Mitsubishi Electric
Greg Stower and Mark Steele

III. Lunch Break

IV. Third Presentation
Companies:
Presenters:
Time: 1:30 p.m. – 3:00 p.m.
CompView with Mitsubishi Electric
Bradley Beck and Mark Steele

V. Fourth Presentation
Companies:
Presenters:
Time: 3:30 p.m. – 5:00 p.m.
Sonitor with Ganz
Jamie Lane and Steven Camarena

VI. Internal Meeting
Time: 5:00 p.m. – 5:30 p.m.

VII. Adjourn

If necessary, the RBF Project Team can also arraign site visits to similar agencies that have installed recently new CCTV systems and/or traffic management system using the latest technology. RBF recently arraigned similar presentations for the City of Garden Grove staff to facilitate their selection for a new TMC and also arraigned visits to other TMCs. The RBF Project Team will meet with City staff to obtain additional information and discuss critical items that may affect our final recommendations. The following items will be discussed with City staff. These are as follows:

- Current traffic signal/signal communications/CCTV Projects
- Other on-going and future City projects
- Preferred Conduit and/or Fiber Optic Alignment
- Verify number of Fiber Optic Strands
- Preferred location of CCTV camera
- Future Location of CCTV Cameras
- Future Location of dMS
- Future Communication Corridors
- Other Future Field Elements
- TMC Upgrades
- Additional Traffic Signal Improvements
- Americans with Disabilities Act (ADA) Improvements

RBF senior staff performed field reconnaissance of the project intersections and project corridors to verify existing conditions and locations of the proposed project improvements. Our Project Team found some possible constraints during this visit. It is recommended that these items be addressed during this phase of the project to facilitate project delivery. Some of the specific items include:

- Right-of-way
- Visibility
- Landscape
- Non-ADA pedestrian ramps
- Other outdated signal equipment
- Current projects under construction

Therefore, it is recommended that during this Phase, the RBF Project Team and City staff visit the project area to discuss these constraints and develop solutions. Some of these constraints and solutions are shown on the Identification of Key Technical Issues and Solutions Section.

In addition, RBF will mark locations where the existing conduit and fiber/hardwired cable was not verified during our site visits due to field constraints including broken pull box lids, locked pull boxes/vaults and pull boxes filled with dirt, water and/or signal/communication/lighting conductors/cables. RBF will request to perform additional site visits at these locations with City's traffic signal crews.

A photo log of each of the project intersections, corridors, and TMC will be maintained. RBF will provide the field notes on a Project Notebook to the City for their use during the review process. The Project Notebook will have field note check lists, photographs, marked as-built plans, and field notes including possible issues and/or constraints.

Based on the information discussed with the City of Garden Grove and prior to the preparation of final PS&E, RBF will prepared a Project ITS Architecture Exhibit that will show existing communication systems and field elements, and proposed and future field elements, in order to understand the necessary improvements and equipment that will be required for this project. In addition, the Project ITS Architecture Exhibit will show the existing communication topology and a recommended project communication topology that can be integrated to support existing, proposed, and future field elements.

The objective of the project architecture exhibit is to understand the City's existing communication infrastructure, the proposed project improvements, and to provide a communication infrastructure that can be expandable and scalable for integration of future ITS improvements.

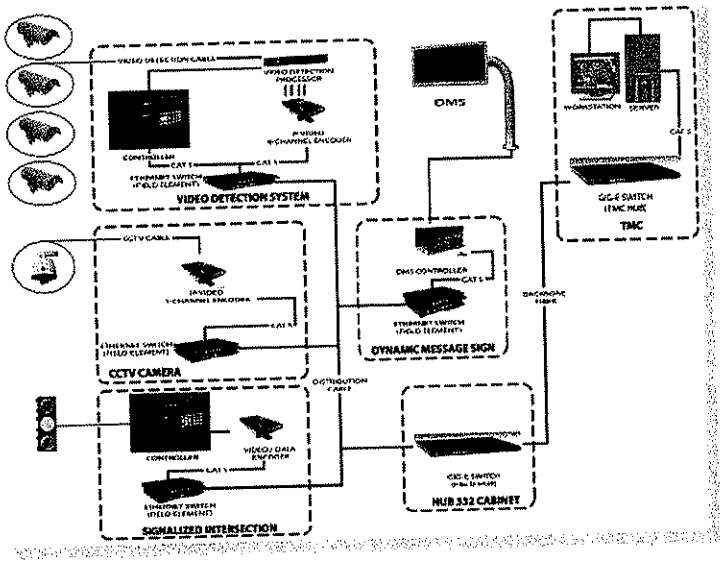


Exhibit 3-1 illustrates a Project ITS Architecture Exhibit that was prepared for the Fiber Optic Signal Interconnect System Phase I Project for the City of Garden Grove.

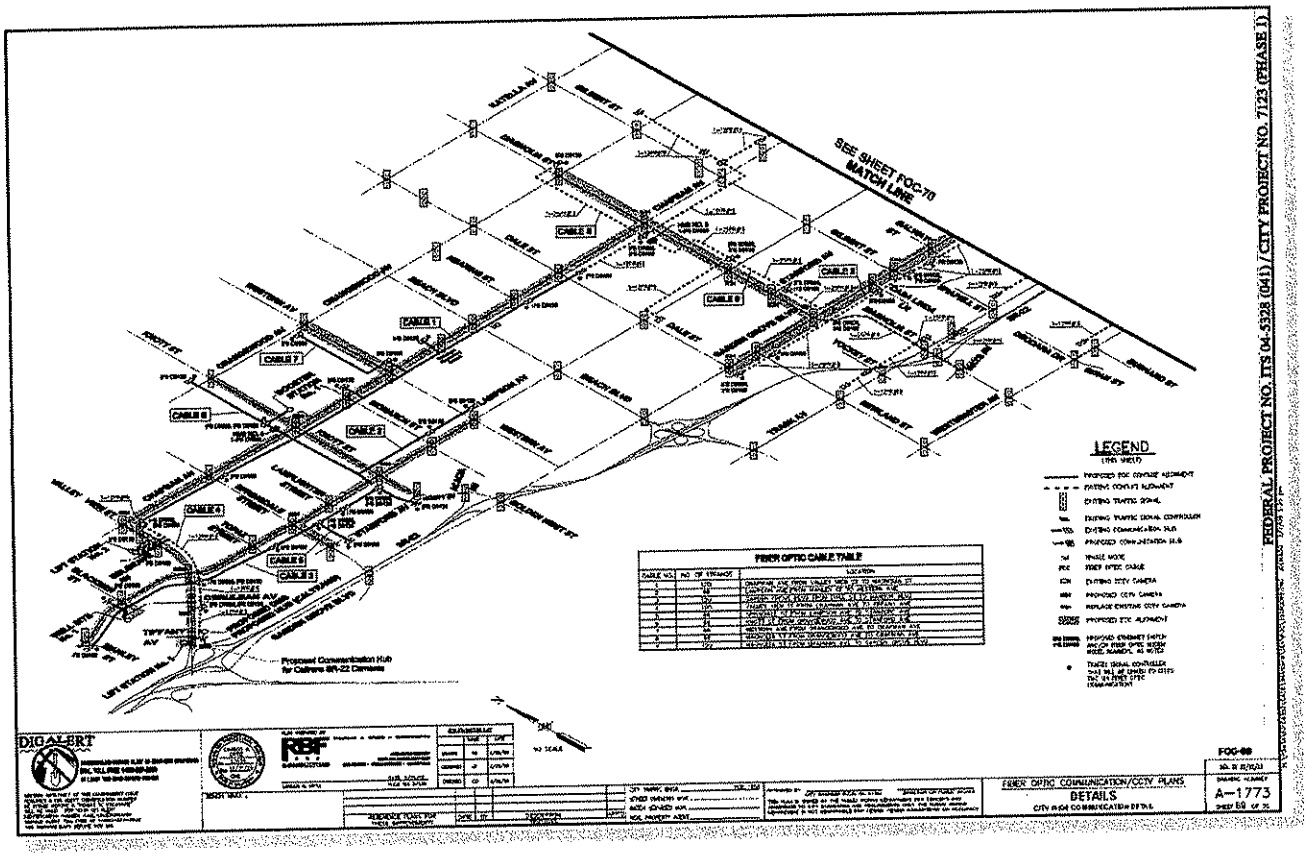


EXHIBIT 3-1

Project ITS Master Plan – City of Garden Grove

The exhibit for this project showed locations of controllers/hubs/CCTV/DMS and conduit/fiber optic alignment including the alignment to the nearest communication hub. A project system architecture exhibit has been prepared for similar projects and these details have been included in the final improvement plans.

We have prepared a similar Project ITS Architecture Exhibit for the proposed improvements as indicated in the RFP. **Exhibit 3-2** illustrates the Project ITS Architecture Exhibit that was prepared for this project.

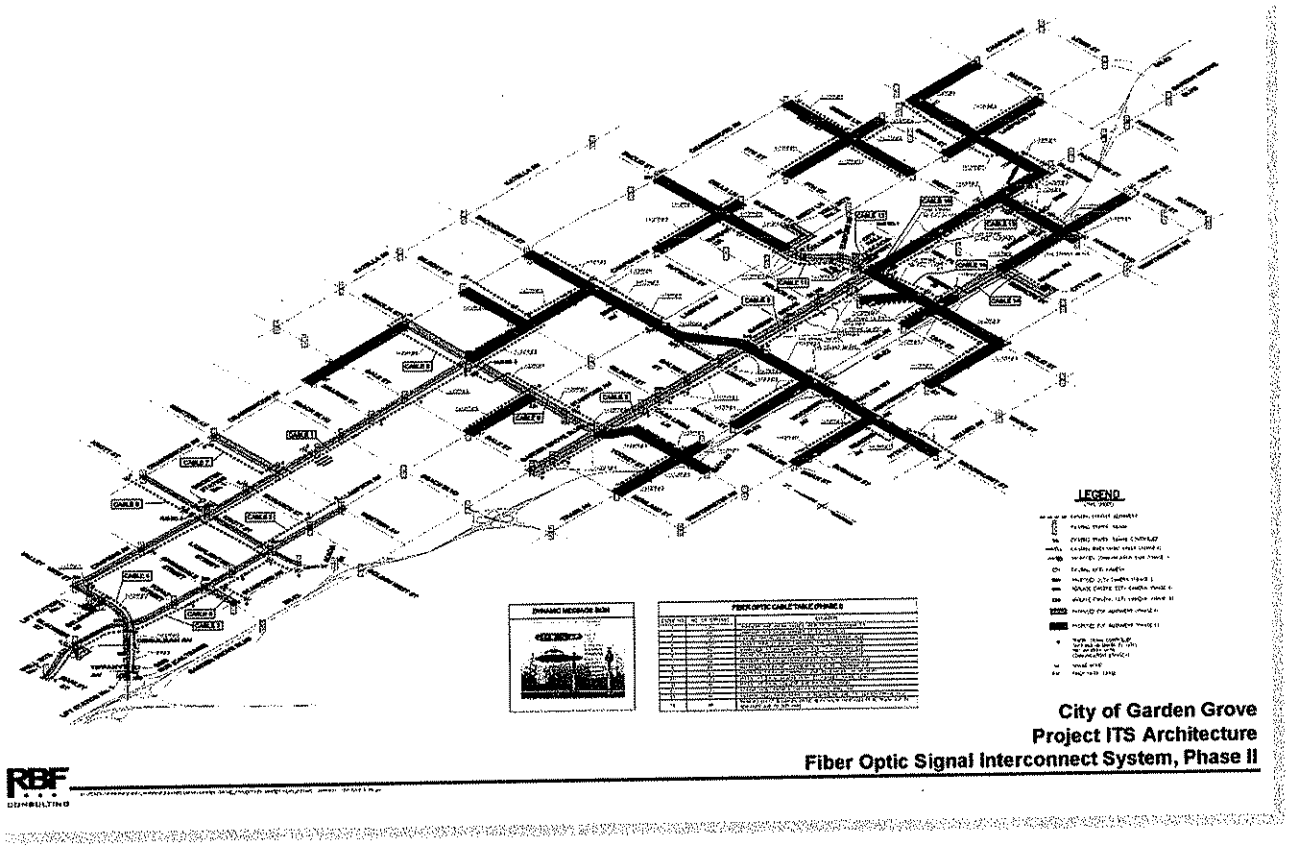


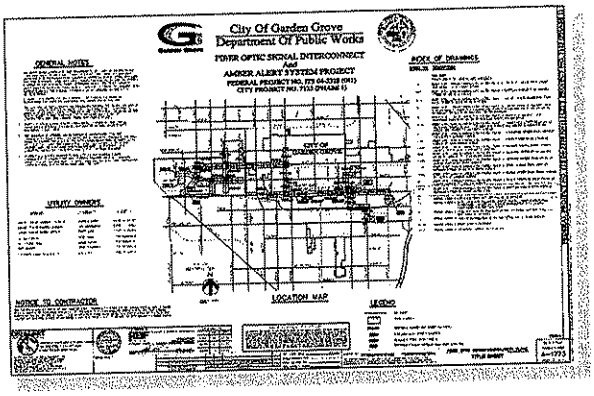
EXHIBIT 3-2

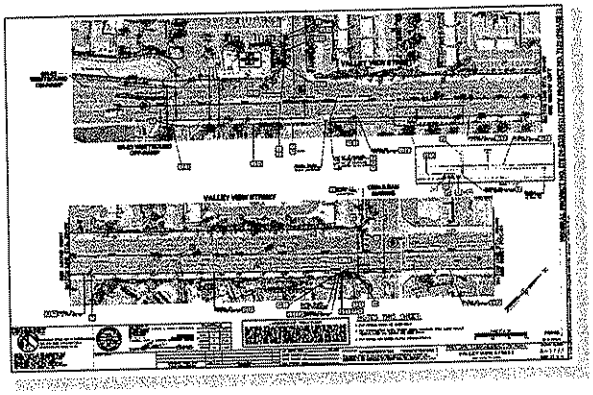
Fiber Optic Signal Interconnect System Phase II Master Plan - City of Costa Mesa

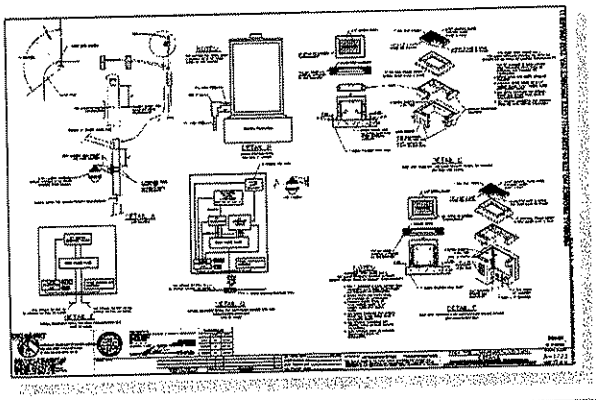
A draft and a final copy will be provided to the City for their review and approval prior to preparation of the final design. These project architecture exhibits have assisted to expedite the preparation of final PS&E for similar projects.

The proposed communication alignment will require coordination with Caltrans and other agencies. Early discussion with the affected agencies will be critical in order to understand their concerns and requirements, and to facilitate their review and approvals.

During this phase, the RBF Project Team will start establishing utility company contacts and coordinate proposed traffic signal / signal communication /field elements improvements impacts to their facilities. Reference plans and data will be provided to the agencies so they can plan any relocation activities. A notice and final plans will be transmitted to the affected utility companies requesting them to contact the City to coordinate any adjustments and relocations. If required, request letters will be provided to Southern California Edison (SCE) for the source of electrical service. The information will be maintained in a matrix and will be updated throughout the project.







Final Engineering (Phase 2)

The preparation of the base plans can start concurrently with the start of the preliminary engineering.

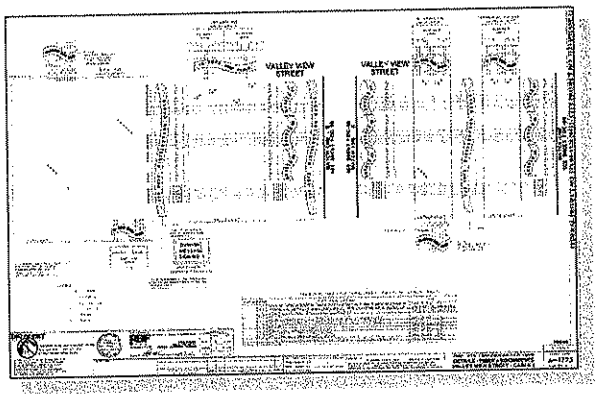
Final plans, specifications and construction quantity take-offs and construction cost estimates will be prepared in accordance with the City of Garden Grove, Manual of Uniform Traffic Control Devices (MUTCD), and Caltrans requirements.

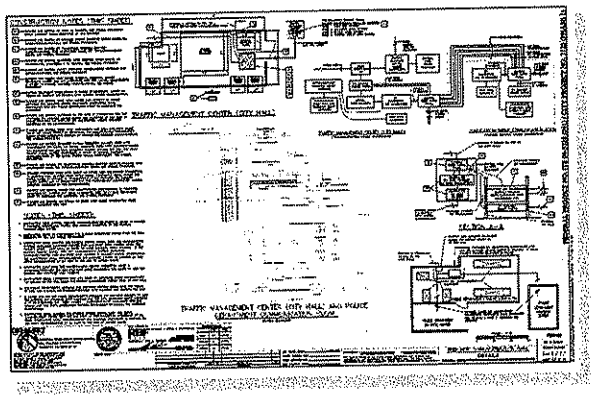
It is anticipated that the proposed improvements including new signal controllers, CCTV system and fiber optic system can be shown on the same 1″ = 40′ fiber optic communication plans. At each project intersection, the plan will show the location of the existing signal controller and cabinet and associated improvements that may be required due to the replacement of the signal controller. Specific details at 1″ =20″ scale will be provided to show these proposed improvements.

The fiber optic communication plans will show the existing communication conduit and hardwired/fiber optic cable, pull boxes, vaults and controller cabinet location/hub locations. The plans will show the installation of the proposed fiber optic communication system including, pull boxes, splice vaults/trays, fiber optic cable and any additional equipment in order to provide a complete system.

The plans will show replacement of the existing pull boxes with number 6 pull boxes or fiber optic vaults, existing conduit within the vicinity of each pull box will be replaced to

allow proper sweeps for the fiber optic system (if required), and installation of new conduit in areas where is needed. Fiber optic drops will be made at each CCTV location and at the project signalized intersection inside a splice vault adjacent to the controller cabinet or per City's requirements. The final plans will detail the splicing and termination schematics for each intersection and hub locations.





The proposed CCTV systems and associated improvements can be included on the fiber optic communication plans with specific details at 1" =20" scale to show the proposed CCTV improvements at each CCTV pole and/or controller cabinet location.

Details will be included for specific equipment that will be required at the signalized intersections and communication hub(s). All new field elements and field element upgrades will be shown on the plans. Additional equipment upgrades, modifications, termination hardware, and related improvements necessary for an effective and efficient communication system will be shown on the plans.

Details will also be included for the proposed CCTV systems including CCTV mounting details, pole type, and hardware components inside the cabinet to link the CCTV cameras to the TMC via the proposed fiber optic system.

Details will also be included for the installation and integration of the new traffic management system and associated improvements at the City's TMC. The fiber optic communication system plans will be prepared in AutoCAD at 1"=40' scale and in accordance with standards set forth by the City of Garden Grove and Caltrans.

The technical specifications will include traffic signal controller system, traffic management system, fiber optic communication, CCTV system, and specific hardware and software requirements, installation requirements, testing, and training requirements in order to implement a complete network system. Also, the technical specifications will include requirements to provide system integration that will link the proposed field elements to the TMC via the proposed and/or existing fiber optic system.

The RBF Project Team will take into account physical constraints that may affect installation of new equipment in order to avoid change orders during

construction. Installation of new traffic signal/CCTV equipment near existing fences, walls, driveways, or above ground utility equipment must provide minimum pedestrian path.

The RBF Project Team will take into account other equipment and system modification requirements for integration with other projects and future implementations that may affect our design. The number of plan sheets is based on the proposed improvements at the project intersections and project corridors included in the RFP.

The RBF Project Team will provide a 30% conceptual plan and PS&E submittals at 90%, 99%, and final completion. The RBF Project Team will submit original mylars, reproducible copies, and electronic files, to the City. A Project Notebook will be provided to the City that will include all the field notes, photos, utility matrix and letters, engineer's estimates, and other pertinent information related to the project. The RBF Project Team will prepare encroachment permit applications and process the PS&E package through Caltrans and affected agencies for facilities within their jurisdiction.

The RBF Project Team will attend the project pre-construction meeting, prepare addenda and respond to requests for information (RFIs) throughout the bidding process. If requested, the RBF Project Team can provide Construction Assistance during construction. The RBF Project Team will provide Record Drawings based on redlined drawings received from the Contractor. The RBF Project Team will submit data/products from all work elements on both hard copy and electronic format. The plans shall be prepared in ACAD format and suitable for immediate integration into the City's existing GIS system.

With a strong management approach and continuous close coordination between the City of Garden Grove and our project team, the preparation of the City's Project should be straightforward with a logical progression through the work tasks. Continuous close coordination, communication and a focused project development process are the keys to successful completion of this important project. In order to complete the project within the proposed time frame, it is essential to develop a team relationship with all of the affected parties, identify responsibilities and obtain a commitment by each team member to the timely review and completion of the tasks within their realm of responsibility.

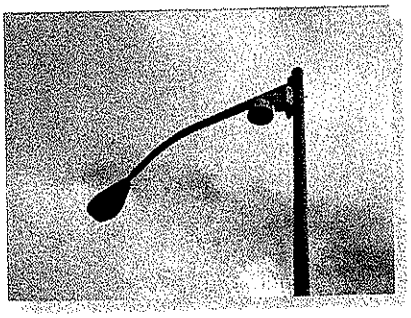
Identification of Key Technical Issues and Solutions

The RBF Project Team has thoroughly reviewed the list of the proposed improvements and performed field reconnaissance of the proposed traffic signal modifications, CCTV locations, and fiber optic communication alignment to better understand the existing infrastructure and the proposed improvements of the project.

Based on the background information our team has compiled, we have identified some key technical issues related to the project. It is essential to understand the following key technical issues prior to and during the design process. These technical issues may develop into potential delaying factors on the projects if not properly address in the design process.

CCTV Camera Locations

Camera Location. At some of the proposed CCTV locations, trees and building obstructions may interfere with the CCTV camera line of sight. At all the proposed CCTV camera locations, it is recommended that a site and path analysis be conducted using a bucket truck in order to select a location where the coverage area can be optimized. Conducting the site and path analysis prior to construction will likely reduce or eliminate complications that may arise during construction. The City can assist the RBF Project Team by providing a bucket truck for the site and path analysis. Digital photos can be taken at the proposed camera height to evaluate possible impacts and provide recommendations.

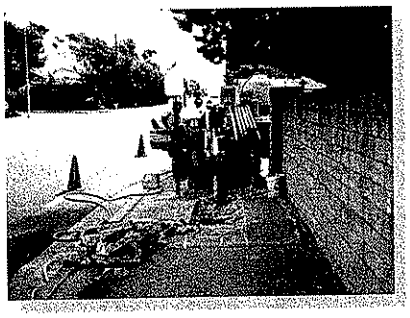


Camera Type. As part of the initial evaluation of the CCTV System, the type of camera will be evaluated in order to meet the City's design requirements.

Therefore, it is essential to discuss the following items during the evaluation of the proposed CCTV system.

- Size and type of camera, lens (fixed or PTZ)
- Type of Camera enclosure (sealed tube or dome)
- Analog or digital camera
- Camera brand name and model
- Camera latest technology

It is also recommended to evaluate if the proposed CCTV camera and/or pole can be incorporated with the existing traffic signal system.

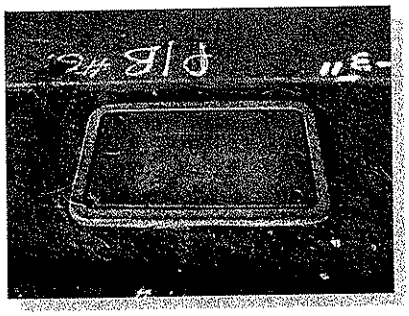


Conduit/Fiber Optic Cable Communication Routes

The City of Garden Grove Fiber Optic Vicinity Map has been provided with the RFP showing the conceptual layout of the City's existing and proposed fiber optic communication trunk lines. The RBF Project Team will discuss with City staff the existing and proposed communication topology. If desired by City staff, the RBF Project Team will evaluate the communication topology and infrastructure and provide recommendations where dual-ring communication topologies can be provided with this project in order to provide dual path communications to the field elements.

An element of our initial alignment analysis will include analyzing the installation of new conduit at locations where the existing conduit cannot be used or where it will more cost effective to maintain the system on one side of the street than to cross over to the other side of the street.

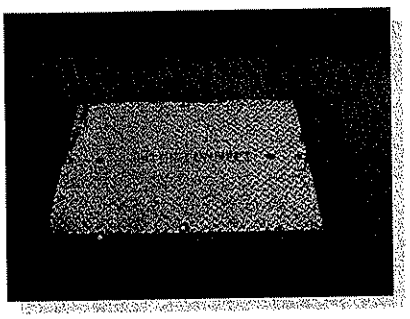
At locations where it requires the installation of new conduit, the segments will be analyzed to minimize replacement of existing sidewalk panels and/or to avoid replacement of decorative sidewalks. Jack and bore new conduit in areas where it crosses the street will be recommended.



Existing Pull Boxes

In order to provide proper bending radius of the fiber optic system at each existing pull box, existing pull boxes may require replacement with number 6 pull boxes or fiber optic vaults and portion of the existing conduit may require replacement in order to allow proper bending of the fiber optic cable.

The work may impact surrounding sidewalks or utilities. Therefore it is essential to review the proposed location of the fiber optic conduit alignment and provide alternatives to minimize the impacts.



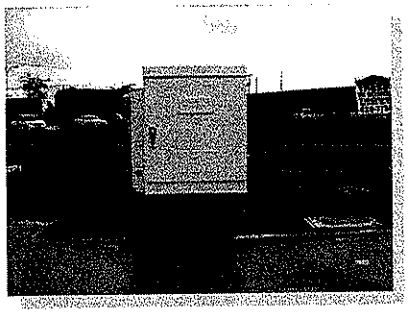
Fiber Optic System Splice Vaults

It is essential to identify the size and location of the fiber optic splice vaults. The splice vaults should be installed at locations where it can be utilized to link other corridors in the future.

The splice vaults should also be installed at locations to minimize impacts and relocation of existing utilities. Sufficient fiber optic cable slack should be provided inside the splice vaults for future demands.

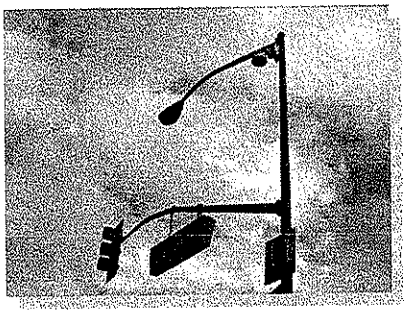
The RBF Project Team will discuss the type and sizes of the fiber optic splice vaults, and the type of the splice vault cover that are typically used by other agencies.

Traffic Signal Controller Cabinets



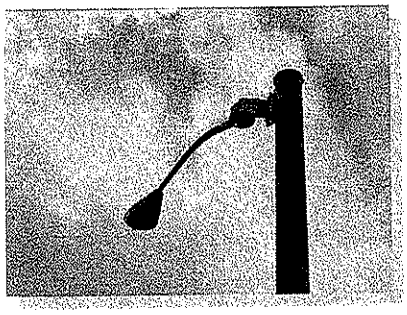
The existing controller cabinets at the signalized locations will be reviewed to identify existing equipment, recommend additional equipment required for the installation of the fiber optic communication systems, and/or CCTV system, and/or new signal controller, and recommend additional equipment that may be required (i.e. additional detection sensor units, video detection system, battery back-up system, etc) and if the cabinet has sufficient capacity for installation of additional equipment. The site visits of the signal controller cabinets will be conducted along with City staff.

Traffic Signal and Intersection Lighting Upgrades



Some of the existing traffic signal equipment at the project intersections, where signal enhancements will be required, are not in good conditions and/or do not meet current standards.

The RBF Project Team will identify the deficiencies and/or proposed improvements not indicated in the RFP (faded signs, missing backplate, 8" signal indications, non-ADA pedestrian push butons, etc.) and will provide recommendations to City staff during the preliminary engineering phase.



Other recommended improvements may include the installation of bird-proofing spikes at selected signalized intersections, and CCTV camera locations, to discourage birds from landing on the new equipment. The City is using similar devices at existing intersections.

Americans with Disabilities Act (ADA) Requirements

Some of the existing pedestrian ramps do not meet ADA current standards. Also, existing traffic signal pull boxes are located within the pedestrian ramps. The RBF Project Team will identify the deficiencies and will provide recommendations to City staff during the preliminary engineering phase. The RBF Project Team will identify the deficiencies and will provide recommendations to the City during the preliminary engineering phase.

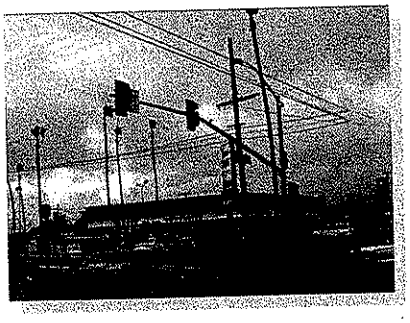
Agency Coordination

The RBF Project Team will coordinate the proposed improvements with City of Garden Grove staff to determine the communication alignment, location

and type of communication equipment, CCTV Systems, and specific equipment that will be required at the intersections, communication hub(s), and the City of Garden Grove TMC in order to provide a complete system.

If required, the RBF Project Team will coordinate with Caltrans District 12 and other agency where the proposed improvements will be encroaching within their facility. The RBF Project Team will provide the encroachment permit applications along with the required plans to Caltrans District 12 for their review and approvals.

Utility Coordination



Installation, modification and/or replacement of traffic signal equipment, and installation of CCTV system, will require close coordination with utility companies to avoid any above ground and/or underground conflicts during the construction of the project.

Coordination with the utility companies will be required to determine the location of the existing utility lines along the corridors and project-signalized intersections, in order to provide proper vertical and horizontal clearance at locations where new controller cabinet foundation, conduit, pull boxes, and/or splice vaults will be installed.

Coordination with SCE will be required to obtain electrical service points for new CCTV systems where an existing electrical service point is not currently provided.

Field verification of other physical constraints that may affect installation of new traffic signal equipment, CCTV systems, and fiber optic conduit/cable must be addressed during the design phase in order to avoid change orders during construction.

Quality Assurance/Quality Control

The RBF Team's Quality Assurance/Quality Control program is a continuous process used not just at project milestones but on a daily basis as work flows from desk to desk, discipline to discipline, and consultant to client. RBF utilizes this QA/QC program on each and every project undertaken to ensure that a high quality product is delivered on schedule and within budget. RBF's key organizational elements for QA/QC are adaptable to any project as evidenced by our performance on recent similar projects which had a strictly defined QA/QC process to be followed. RBF has developed project specific QA/QC plans for other clients such as Caltrans and the Santa Barbara County Association of Governments. This program consists of the following key elements.

Overall Design Manager Supported by Permanent Design Teams

The Design Manager will be supported by permanent Design Team discipline leaders. In addition, RBF assigns staff to discipline leaders on a permanent basis rather than on a project by project or "pool" basis. This is a crucial first step in delivering a high quality project, as quality truly suffers when a project does not maintain staff and leadership continuity. RBF has an outstanding record of maintaining Design Team leaders and design staff throughout our projects.

Design Discipline Scope of Work/Responsibilities

This component of our QA/QC program ensures "buy-in" from RBF's discipline leaders on the scope of work, project responsibilities, schedule and budget. Discipline leaders are involved throughout the development of the scope of work, schedule and budget during the proposal process. Internal kick-off meetings are then held to review scope, schedule and budget to ensure that the project gets started on the right path. This process improves accountability for each leader and reinforces the detailed elements of the scope of work that must be adhered to in order to maintain a high quality project approach.

Design Criteria Establishment

Critical to the success of any project is developing a clear understanding of design criteria, guidelines and standards up-front that will be used for the project. Depending on the complexity of the project, RBF develops Basis of Design Reports, or other less involved documentation for non-complex projects, that clearly identify key design criteria for a project and obtain concurrence from the appropriate Agency personnel. In addition, RBF and

our key discipline leaders have a long history of performing similar work, thus our team is intimately familiar with all aspects of the project development process including design standards and design manuals for roadway, traffic and drainage, and preparation of specifications and bid documents.

"Over the Shoulder" Reviews

RBF's plan development process is a dynamic, interactive process between the Project Manager, Design Manager, Discipline Leaders, and engineering design staff. Regular "over the shoulder" reviews occur throughout the design process through internal discussions in the engineering staff's work areas at various points during plan preparation. This approach maintains discipline leadership involvement throughout design and avoids misdirection and re-design efforts.

In-House Project Team Meetings/Coordination

The Project Manager and Task Leaders will hold regular in-house project team meetings with design discipline leaders to coordinate project interface issues and ensure that a "cause and effect" analysis of design decisions that involve multiple design disciplines is completed. These in-house meetings serve as a forum for regular communication within the entire RBF Project Team that fosters development of a cohesive teamwork environment and builds accountability within the Project Team.

Coordination Meetings/Action Item Tracking

RBF will chair and lead regularly scheduled Project Team meetings with the City, the RBF Project Team and other involved agencies as required. RBF will prepare detailed, timely meeting minutes in a comprehensive format that includes action item tracking embedded within the meeting minutes. This easily allows for carrying action items from one meeting to the next meeting until a final disposition on the action item is reached. This method has been very successful on our past projects for providing clear structure to the resolution of all action items throughout the development of the project and is invaluable in re-tracing project decisions if needed.

Project Communication/Documentation

One critical element for a quality project is to carefully document project decisions and direction, and the general project development history. Preparation of clear, concise letters, phone logs, meeting minutes and action item resolutions avoid costly re-direction during design that could also have impacts on the project schedule. In addition, RBF prepares detailed

"Response to Comment" letters for all Agency milestones submittal review comments that show both the comment itself and a complete response to each comment.

CADD Management System

RBF will incorporate the use of AutoCAD Release 2009 complimented by Softdesk and Land Development Desktop 2i (LDD2i). RBF maintains and manages these CADD platforms to coordinate with subconsultants and to adhere to Agency CADD requirements. RBF will perform all City work utilizing the AutoCAD system. All work will be in conformance with the City's requirements. RBF will submit all deliverable files in an electronic submittal consisting of a compact disk (CD) with all deliverable files (plan sheets) copied onto the CD in AutoCAD format with all reference master files provided. The files will contain all pertinent information, all design details, and title and general note sheets.

Milestone Submittal Plan Reviews

All submittals to the City will meet the project schedule agreed to by the City and will comply with the standards and procedures established by the City for development of Plans, Specifications and Estimates. Each deliverable item will be developed, checked, revised, and verified through a continuous process prior to submittal. The Project Manager, Assistant Project Manager, and Task Leaders will perform a complete quality control review of the plans, specifications and cost estimate at each milestone submittal. Review comments will be noted in red, incorporation of the comments or revisions will be yellow highlighted and any clarification or response to the reviewer will be shown in green.

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 4: Work Plan

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 4: WORK PLAN

Scope of Work – Project Tasks

In order to maintain all the activities that will be required, we have divided our Work Program into ten (10) project tasks:

TASK NO.	TASK TYPE
1	Data Collection and Survey of Existing Conditions
2	Utility Notification and Coordination
3	Fiber Optic Signal Communication, CCTV, Traffic Signal Controller Replacement Plans
4	Fiber Optic, CCTV, Traffic Signal Controller, Traffic Signal Management System Details
5	Technical Specifications
6	Engineer's Estimates
7	Permits and Approvals
8	Project Coordination and Meeting Attendance
9	Project Design Notebook
10	Construction Assistance

Product:

- Data Collection and Survey of Existing Conditions

TASK 1 DATA COLLECTION AND SURVEY OF EXISTING CONDITIONS

The RBF Project Team will obtain all existing reference documentation from the City of Garden Grove, including improvement plans (street, street lights, traffic signals, signal communication, signing/striping, etc.), aerial photographs, right-of-way information and other applicable data.

Senior level traffic engineers of the RBF Project Team will perform an in-depth field analysis of the project intersections and along the project corridors. The RBF Project Team will also verify location of existing traffic signal equipment, signal communication equipment, CCTV systems, medians, pedestrian ramps, sidewalks, and driveways. The RBF Project Team will field review existing and proposed splice vaults/hub locations, and the City of Garden Grove Traffic Management Center (TMC).

Field notes and a photo log of the project intersections, project corridors, and the TMC including existing traffic signal equipment, CCTV equipment, communication hubs, and signal communication equipment will be maintained. Photos of utility equipment, fence, wall, sidewalk, driveway, building frontage, landscape, or any other constraint that may interfere with

the proposed improvements at the intersections and along the roadway segments will be maintained.

Upon completion of the above items, RBF will identify any potential constrains that may be encountered in relation to proposed improvements.

Task 2 Utility Notification and Coordination

Product:

- Utility Notification and Coordination

Utility notifications to the various utility owners within the sphere of the Project will be prepared. The RBF Project Team will request locations for existing and proposed underground and overhead utilities, including high risk utilities. Provide coordination interface to establish controls for utilities that would be included within the right-of-way limits, and identify existing underground and overhead utility lines that may interfere with the location of the proposed traffic signal equipment. The utility information provided by the agencies will be delineated on the plans based on their record drawings and our field review.

The RBF Project Team will compile the information in a matrix format to include dates of notification, persons/utility notified and responses from utility. Letters will be forward to the utility companies requesting their verification of their review of the preliminary and final plans and concur with the information shown on the plans. Copies of this information will be updated periodically and provided to the City of Garden Grove at the schedule project meetings and/or as the information has been received.

The RBF Project Team will coordinate with SCE for source of electrical service points if new service point connections will be required.

Task 3 Fiber Optic Signal Communication, CCTV, and Traffic Controller Replacement Plans

Product:

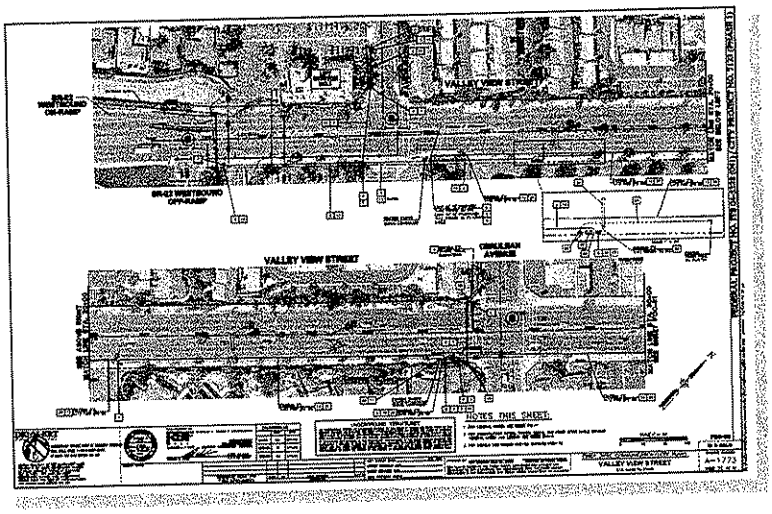
- Project ITS Architecture Exhibit
- Fiber Optic Signal Communication Plans (65 Sheets)

RBF will provide fiber optic communication, CCTV, and traffic signal controller replacement plans for the proposed improvements along the Project Corridors.

Prior to the submittal of the design plans, the RBF Project Team will prepare a Project ITS Architecture Exhibit that will show existing communication systems and field elements, and proposed and future communications systems and field elements, in order to understand the necessary improvements and equipment that will be required for this project. The objective of the project architecture exhibit is to understand the City's existing communication infrastructure, the proposed project improvements, and to provide a communication infrastructure that can be expandable and

scalable for integration of future ITS improvements. It will also assist to expedite the preparation of the final PS&E.

The plans will show existing/proposed conduit and fiber optic cable alignment, existing/new signal controller, CCTV pole and camera location, controller cabinet, CCTV service enclosure, and proposed fiber optic communication equipment and CCTV communication equipment at each signalized intersection/CCTV cabinet.



The fiber optic communication system plans will show the installation of the proposed fiber optic communication system including, pull boxes, communication hubs, and splice vaults. The plans will show replacement of the existing pull boxes with number 6 pull boxes (if required) or fiber optic vaults, existing conduit within the vicinity of each pull box will be replaced to allow proper sweeps for the fiber optic system, and installation of new conduit in areas where is needed. Fiber optic drops will be made at each signalized intersection and/or CCTV/hub location inside a splice vault adjacent to the controller cabinets.

In addition, the fiber optic communication system plans will illustrate the communication link between the proposed fiber optic communication system/ CCTV system/ traffic signal controller improvements along the Project Corridors and the City of Garden Grove TMC in order to provide a complete communication system between the filed elements at the TMC. The plans will show any upgrades that may be required at the communication hubs and TMC.

The proposed CCTV systems and associated improvements can be included on the fiber optic communication plans with specific details at 1″ =20″ scale to show the proposed CCTV improvements at each CCTV pole and/or controller cabinet location.

The proposed new signal controllers and associated improvements can also be included on the fiber optic communication plans with specific details at 1″ =20″ scale to show the proposed improvements at each controller cabinet. All the proposed field elements will be shown on the plans. Additional equipment upgrades, modifications, termination hardware and

related improvements necessary for an effective and efficient communication system will be shown on the plans.

A title sheet for the project plans will be prepared in accordance with City of Garden Grove standards.

One of the critical issues related to the schedule for completion of the PS&E will involve the development of base plans, particularly related to the corridors communications layouts. As part of our up front efforts, we will assess the condition of base plans and as-built plans that are available from the City and determine the most efficient manner to provide base plans for the project. This decision will be made based on the optimal method to meet the projects critical schedule. The fiber optic communication plans will then be prepared in AutoCAD based on as-built plans or aerial drawings at 1″=40′ scale and in accordance with standards set forth by the City of Garden Grove and Caltrans. The plans will be prepared in AutoCAD Release 2006 or 2009.

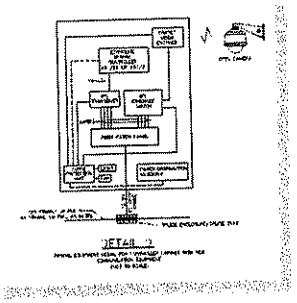
Task 4 Fiber Optic Signal Communication, CCTV, Traffic Signal Controller Replacement, Traffic Management System Details

Product:

- Detail Sheets (8 Sheets)
- Fiber Optic Communication Assignment Details (21 Sheets)

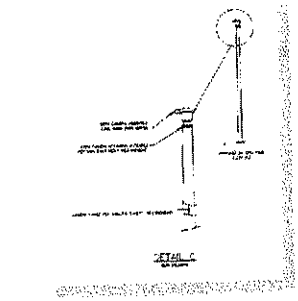
RBF will provide fiber optic communication, CCTV system, and traffic signal controller replacement details that will be required to show specific installation and hardware components for the proposed improvements.

Fiber optic communication detail sheets will be included showing details for splice vaults, pull boxes, conduit sweeps, trenching, splice enclosures, splicing details and termination schematics, and general notes.



CCTV system details sheets will be provided showing CCTV pole and camera type and camera mounting requirements. Details showing hardware components inside the cabinet (i.e. video encoders, Ethernet switches, etc) to transmit video and data to the TMC will be provided.

Traffic signal controller replacement details sheets will also be provided showing replacement of existing signal controller with new signal controller and necessary hardware components inside the cabinet (i.e. Ethernet switches, etc) to transmit data to the TMC.



It is anticipated that fiber optic communication assignment details will be required to show how each strand of the 12, 48 and 120 single-mode fiber optic cable will be connected to each field element and the communication hubs. The detail sheets will be prepared in AutoCAD Release 2006 or 2009.

Product:

- Project Specifications

TASK 5 TECHNICAL SPECIFICATIONS

The RBF Project Team will prepare Bid-ready Technical Specifications for inclusion in the City's construction bid documents. The Technical Specifications will include specifications for all the required traffic signal equipment, fiber optic communication system, CCTV system, traffic management system, communication software, fiber optic cable/CCTV/signal controller manufacturing, delivering and testing requirements, and any additional item that may be required for the project (controller cabinet upgrades, pedestrian ramps, etc.).

Fiber optic communication equipment including Ethernet switches or modems required at the signalized intersections and/or CCTV/traffic signal cabinets, communication hubs, and the City's TMC will be specified in the technical specifications including system integration in order to provide a complete system. Application and/or permits required by the affected agencies will be included in the Appendix.

Product:

- Quantity and Cost Engineer's Estimates

TASK 6 ENGINEER'S ESTIMATES

The RBF Project Team will also prepare construction quantity take-offs and construction cost estimates in accordance with City and Caltrans requirements for the proposed traffic signal controller upgrades, fiber optic communication system, CCTV systems, and related improvements. The engineer's construction cost estimates will be prepared in MS Excel format for use by the City to advertise for bids.

Product:

- Permits and Plan Approvals

TASK 7 PERMITS AND APPROVALS

It is anticipated that the proposed fiber optic communication improvements will require coordination and approval from Caltrans District 12, City of Westminster, City of Anaheim, City of Stanton and other agencies. The RBF Project Team will secure appropriate approvals and permits from the City of Garden Grove, Caltrans District 12, and other agencies as required. The project will be coordinated with these agencies to obtain the required clearances and assure that the PS&E are prepared in compliance with the agencies requirements.

Submittals to the City of Garden Grove, Caltrans District 12 and other agencies will include all plans, specifications, engineer's estimates (if required) and required backup data for review. Upon receipt of comments, the RBF Project Team will make revisions to PS&E documents following plan check as necessary for final submittal. The RBF Project Team will also provide final revised quantity take-offs and cost estimates.

When corrections have been made, the RBF Project Team will provide signed mylars of plans and design documents to the City of Garden Grove, Caltrans District 12, and other agencies for their approval.

TASK 8 PROJECT COORDINATION AND MEETING ATTENDANCE

Product:

- Project Coordination and Meetings Attendance

The RBF Project Team will attend meetings with the City, Caltrans District 12, and others as directed by the City to discuss design issues, progress schedule, conduct field analysis and provide technical design clarification. We will also attend any meetings called by the City, or other agencies, at which Consultant's attendance is requested.

In order to complete the PS&E package as indicated in the project schedule, it is anticipated that bi-weekly meetings will be necessary.

The RBF Project Team will prepare and distribute meeting minutes and an action item matrix to the project team as appropriate. The RBF Project Team will meet with the City project manager on a weekly basis to review the status of the project, completed tasks and planned tasks. Progress report and schedules will be provided to the City weekly or as required.

TASK 9 PROJECT DESIGN NOTEBOOK

Product:

- Project Design Notebook

The RBF Project Team will maintain a Project Design Notebook throughout the Project. It will include all pertinent information organized in chronological order, utility information, final engineering calculations, quantities, cost estimates and photographs. Each section will be divided with labeled dividers. Dated photographs (4″ x 6″) of existing conditions along the proposed alignment will be provided. Information relate to the photographs in relation to location, direction and relevance of it will be provided in the Project Design Notebook.

The Project Design Notebook will be a three-ring binder with slip-in covers. It will be labeled with the project name, number and date completed. It will include RBF address and phone number and it will be stamped and signed by the Project Manager.

TASK 10 CONSTRUCTION ASSISTANCE

Product:

- Construction Assistance

RBF will provide construction plan interpretation and consultation during the bidding and construction phases of the Project. RBF will assist the City in preparing bid addenda as required to provide clarification to the drawings. RBF will attend the pre-construction meeting in order to provide construction plan interpretation.

RBF will provide response to Contractor's requests for information (RFI) about the plans and specifications forwarded to RBF by the City. This task includes conferring with the Project Resident Engineer regarding the RFI as appropriate. Regularly scheduled construction observation or attendance at weekly meetings is specifically excluded from this scope of work. Services under this task will be based on "as requested" time and materials basis.

Exclusions

Consulting services relating to any of the following tasks may be completed by RBF Consulting if negotiated under a separate contract for an additional fee; but are presently excluded from this Agreement:

- Traffic Signal and Intersection Lighting Modification Plans
- Analysis and Engineering Reports
- Additional Communication Plans and Details
- Additional Fiber Optic Assignment Details
- Traffic Control Plans
- Signing and Striping Plans
- Construction Administration and Inspection
- Utility Potholing

Submittals

When the PS&E submittal is deemed acceptable by the City, the RBF Project Team will submit the appropriate number of prints for distribution as determined by the City. The following is a list of our submittals to the City:

- Plan submittals at 90%, 99% and final completion
- Minimum of three (3) sets of plans and specifications will be provided to the City during each submittal. Engineer's Estimates will be provided with the last two submittals
- Project Design Notebook Submittal at 90% and final completion
- Upon project completion, three (3) sets of approved plans and specifications will be provided to the City
- Hardcopy and electronic format of data /products from all work elements
- Original mylars, reproducible copies, electronic files and word documents, as specified by the City

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 5: Project Schedule

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 5: PROJECT SCHEDULE

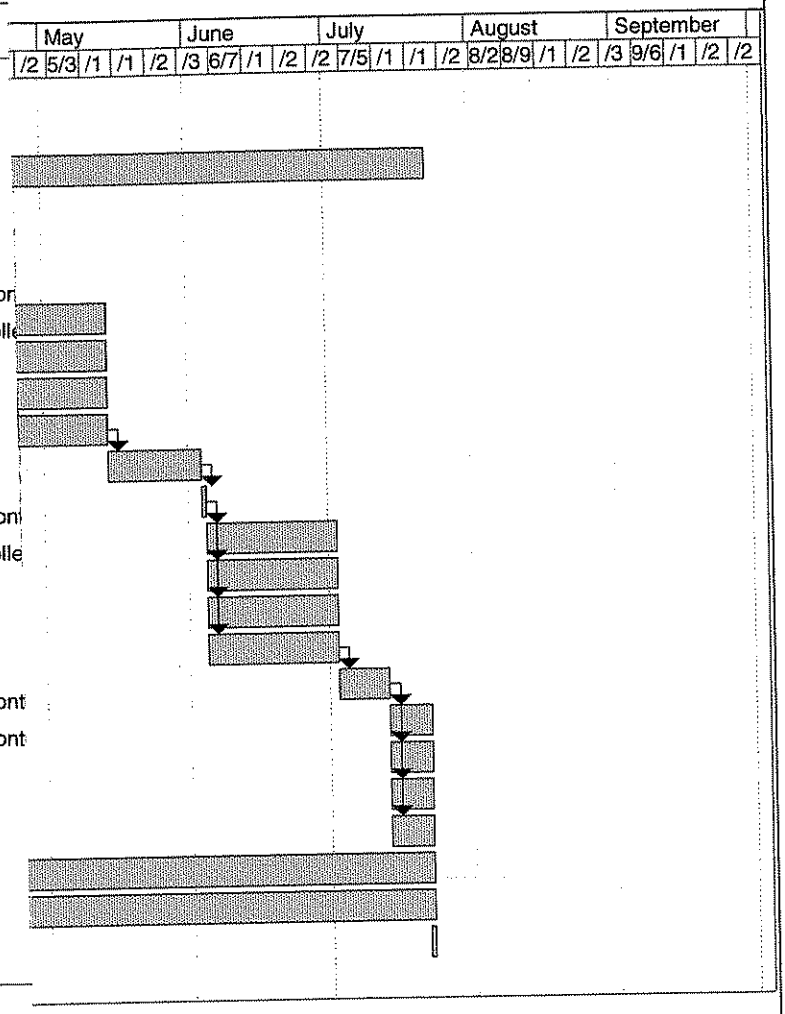
Effective scheduling and cost control are critical activities throughout this Project. RBF has developed an innovative approach to accomplish the objectives of completing the Fiber Optic Signal Interconnect System, Phase II Project as early as possible which will result in time and project cost savings.

The RBF Project Team has the resources available to meet or accelerate the project deadline. The RBF Project Team will commit to delivering final report, and final plans, specifications and estimates within the project schedule.

In addition to the committed staff, RBF has additional support that may be called upon should this project require, as presented on the organization chart.

RBF is well versed in responding to projects that have important deadlines relative to funding constraints or public delivery commitment. Our proposed project schedule to complete the project within the required time frame is shown on the following page.

ID	Task Name
1	Kick-Off Meeting
2	Data Collection and Survey of Existing Conditions
3	Utility Notification and Coordination
4	Project ITS Architecture Exhibit
5	City's Review
6	Review Comments Meeting/Workshop
7	Fiber Optic Signal Communication, CCTV, and Traffic Signal Cor
8	Fiber Optic Signal Communication, CCTV, Traffic Signal Controll
9	Technical Specifications (90% Submittal)
10	Engineer's Estimates (90% Submittal)
11	City's Review
12	Review Comments Meeting/Workshop
13	Fiber Optic Signal Communication, CCTV, and Traffic Signal Con
14	Fiber Optic Signal Communication, CCTV, Traffic Signal Controlle
15	Technical Specifications (99% Submittal)
16	Engineer's Estimates (99% Submittal)
17	City's Review
18	Fiber Optic Signal Communication, CCTV, and Traffic Signal Cont
19	Fiber Optic Signal Communication, CCTV, and Traffic Signal Cont
20	Technical Specifications (Final Submittal)
21	Engineer's Estimates (Final Submittal)
22	Permits and Approvals
23	Project Coordination and Meeting Attendance
24	Project Design Notebook
25	Construction Assistance



Project: Project Schedule
Date: 12/18/08

Task

Split

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 6: Project Work Hours

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 6: PROJECT WORK HOURS

Project Work Hours Matrix

The following page contains a detailed breakdown of our project work hours allocation.

RBF CONSULTING

CITY OF GARDEN GROVE
ENGINEERING DESIGN SERVICES
FIBER OPTIC SIGNAL INTERCONNECT SYSTEM, PHASE II

TASK	DESCRIPTION	NO. OF SHEETS	PROJECT/FUNCTIONAL MANAGER	PROJECT ENGINEER	DESIGN ENGINEER	CADD TECHNICIAN	TOTAL
		Shts	Hours	Hours	Hours	Hours	Hours
	FIBER OPTIC SIGNAL INTERCONNECT SYSTEM, PHASE II						
1	Data Collection and Survey of Existing Conditions		8	24	140	20	192
2	Utility Notification and Coordination		2	8	24	32	66
3	Fiber Optic Communication, CCTV, and Traffic Signal Controller Replacement Plans	65	24	136	244	880	1284
4	Fiber Optic Communication, CCTV, Traffic Signal Controller, Traffic Signal Management Details - ***Fiber Assignment Details***	21	8	32	96	175	311
	Fiber Optic Communication, CCTV, Traffic Signal Controller, Traffic Signal Management Details	8	2	8	16	32	58
5	Technical Specifications		6	24	30		60
6	Engineer's Estimates		2	18	34		54
7	Permits and Approvals		4	30	44		78
8	Project Coordination and Meetings Attendance		16	30	10		56
9	Project Design Notebook		0	0	4		4
10	Construction Assistance		8	16	20		44
TOTAL -		94	80	326	662	1139	2207

180 x 80 = 14400 326 x 160 = 52160 62750 85425

Total 234,735

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

RBF CONSULTING

Section 7: Fee Proposal

Personal Commitment

Effective Communication

Exceptional Client Service

SECTION 7: FEE PROPOSAL

As requested, our fee proposal for the City of Garden Grove's Fiber Optic Signal Interconnect System, Phase II project is enclosed in a separately sealed envelope.

Initiative

Teamwork

Dedication

Responsiveness

GARDEN GROVE

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Appendix

Personal Commitment

Effective Communication

Exceptional Client Service

APPENDIX: RESUMES

The following pages contain detailed resumes for our proposed project team. We are confident that our team has the robust and diverse experience and technical expertise to successfully deliver your project. Our team is available and ready to serve your staff and the City of Garden Grove.

Carlos A. Ortiz, PE, TE, PTOE

Project Manager

Mr. Ortiz manages the traffic engineering aspects for RBF's transportation projects. Mr. Ortiz's professional experience includes the design of site and grading improvements, street improvements, intelligent transportation systems, traffic signals, legacy/Ethernet communication systems, lighting, ramp metering systems, traffic monitoring systems, dynamic message sign systems, stage construction/traffic handling, and signing and striping. Mr. Ortiz is also experienced in intersection realignment studies, traffic impact studies, sight distance analysis studies, speed limit studies, left turn storage studies, traffic warrant studies, and stop sign warrant studies for government and private development projects.

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Fiber Optic Signal Interconnect and Amber Alert System (Garden Grove, CA) - This is the first fiber optic communication project within the City that consists of installing approximately seventeen (17) miles of fiber optic cable interconnecting approximately twenty-two (22) signals, providing fiber optic communication to six (6) Circuit Television cameras (CCTV) and two (2) Dynamic Message Signs (DMS). The proposed fiber optic communication system will connect to the City's Traffic Management Center (TMC) and the City's Police Department control center. The Police Department will also have access to CCTV camera system and control the DMS in order to provide messages for an amber alert. This project includes upgrading the City's existing TMC integrating the City's existing hardwire (copper) communication and the proposed fiber optic

Registration:

1997, Civil Engineer, CA, C057535

1999, Traffic Engineer, CA, 2025

1999, Civil Engineer, AZ, 34333

1999, Professional Traffic Operations Engineer, US, 426

Years of Experience: 19

Education:

B.S., 1989, Civil Engineering, California State Polytechnic University, Pomona

Professional Affiliations:

President, Southern California Section, Institute of Transportation Engineers

Past-President, Riverside-San Bernardino Section, Institute of Transportation Engineers

Member, Institute of Transportation Engineers

Past-President, Orange County Traffic Engineering Council (OCTEC)

Member, American Society of Civil Engineers, Past-President Orange County Younger Member Forum

Member, American Public Works Association

communication systems. A project area master plan/system architecture was developed to show the proposed communication network system. Mr. Ortiz serves as the Project Manager and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the traffic signal interconnect systems, and CCTV systems.

City of Orange Fiber Optic Interconnect and Closed Circuit Television (CCTV) Camera Surveillance System Project (Orange, CA) - This project consisted of installing a fiber optic interconnect system and a hardwired interconnect system to coordinate the signalized intersections along Katella Avenue, Tustin Street, Main Street and La Veta Avenue. The project also involved the installation of Closed Circuit Television (CCTV) camera systems at seventeen (17) locations to provide the City of Orange the capability to observe traffic operations. The proposed fiber optic interconnect system will connect to the City's Traffic Management Center (TMC). A project area master plan/system architecture was developed to show the proposed communication network system. Mr. Ortiz served as the Project Manager and was responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the traffic signal interconnect systems, and CCTV systems.

Video Surveillance Integration Gap Closure Project (Culver City, CA) - This project consisted of installing closed circuit television system at ten (10) signalized intersections along Jefferson Boulevard, Culver Boulevard, Washington Boulevard and Sepulveda Boulevard to provide the City of Culver City the capability to observe traffic operations and expand their system architecture. The project also included installation of a 48-strand single mode fiber optic communication system to link the CCTV systems to the City Hall Hub and the Maintenance Yard. The project also included a CCTV workstation at the maintenance yard. Mr. Ortiz served as the Project Manager and was responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the CCTV systems and the fiber optic system.

Ocean Avenue and 2nd Street Fiber Optic and CCTV Communication Project (Santa Monica, CA) - This project consists of installing a fiber optic interconnect system to coordinate ten (10) signalized intersections along Ocean Avenue and installing Closed Circuit Television camera systems (CCTV) at three (3) locations to provide the City of Santa Monica the capability to observe traffic operations. The project also includes a fiber optic system along 2nd Street to link to the City's four (4) Parking Structures. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Ortiz serves as the Project Manager and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the traffic signal interconnect systems, and CCTV systems.

Traffic Management System Operations Study (TMSOS) (Irvine, CA) - RBF was responsible for the City of Irvine's Traffic Management System Operations Study. In an effort to keep pace with the evolving communications and ITS industry, City staff and RBF evaluated the City's 65 CCTV cameras, eight (8) video detection systems, and six (6) changeable message signs, which are controlled from the City's traffic management center (ITRAC). Mr. Ortiz assisted in the preparation of the detailed evaluation of the City's Advanced Traffic Management System and Communications Infrastructure focusing on Central Traffic Control System, Traffic Signal Controller Technology, Communications Infrastructure and Topology and ATM and Ethernet Backbone Data Transport. This study included an evaluation of the existing system's worth and forecast costs for the planned improvements. The study focuses on generating long-range forecasts for maintaining and rehabilitating the traffic signal system.

Citywide Traffic Control and Transit Signal Priority System (Beverly Hills, CA) - Project Manager. RBF developed traffic signal and intersection lighting modification PS&E for twenty-seven (27) signalized intersections along two major corridors. The plans were designed to include new 2070 traffic signal controllers and the installation of special loop detectors (MTA loop detectors) that will be used as part of Metropolitan Transportation Authority (MTA) Bus Rapid Transit (BRT) System. The project included linking the citys new Traffic Control System with the City of Los Angeles ATSAC to support the Transit Signal Priority System.

Lexington Road and Burton Way Traffic Signal Improvements (City of Beverly Hills, CA) - The project involved modification of four traffic signals, installation of one new traffic signal with CCTV, and storm drain system and intersection improvements. The project also included installation of traffic signal interconnect systems Along Lexington Road and Burton Way. Mr. Ortiz served as the project manager and was responsible for preparation of plans, specifications, and probable cost estimates for the proposed improvements.

Santa Monica Boulevard Fiber Optic Communication Project (Santa Monica, CA) - This project consists of installing a fiber optic interconnect system to coordinate eight (8) signalized intersections along Santa Monica Boulevard. The project also includes a link to the City's communication room of the City's new library along Santa Monica Boulevard. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Ortiz serves as a Project Manager and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

Anaheim On-Call Traffic Engineering Services (Anaheim, CA) - The project consists of providing traffic engineering services, signing and striping plans, traffic signal plans, and fiber optic communication plans. Mr. Ortiz serves as the Project Manager and works closely with City staff to provide plans, specifications, and engineering estimates (PS&E) for various projects. Completed projects to date include Brookhurst Street and Brookmore Avenue Traffic Signal Installation Project, Greenleaf Street and Magnolia Avenue Traffic Signal Installation Project, Faircrest Drive and Western Avenue Traffic Signal Installation Project, Canyon Creek Road and Serrano Avenue Traffic Signal Modification Project, and the Lincoln Avenue Signal Improvement Project.

John Dorado II

Deputy Project Manager

Mr. Dorado has many years of experience in the field of transportation engineering (including two years as a transportation-engineering intern). Having a balanced understanding between planning and design, Mr. Dorado has been exposed to projects in the public and private sector ranging from traffic studies to highway design.

His experience in transportation planning has involved traffic impact studies and traffic forecast modeling. In addition, he has extensive experience in the use of technical software including: TRAFFIX, SYNCHRO, AUTOCAD 2000, GUIDSIGN, Webster and the Highway Capacity Manual software (HCS).

Mr. Dorado also has prepared specifications, cost estimates, and designed various traffic signals, traffic signal modifications, closed circuit television (CCTV) camera systems, communication hub upgrades and installations, traffic management center (TMC) upgrades and workstation installations, transit signal priority (TSP) systems, legacy/Ethernet fiber optic communications, interconnect, signing and striping, and traffic control plans for various agencies in Southern California.

Registration:

2003, Engineer-In-Training, CA, 116452

Years of Experience: 9

Education:

B.S., 1999, Civil Engineering, California State University, Fullerton

Professional Affiliations:

Member, Institute of Transportation Engineers

Member, OCTEC - Orange County Traffic Engineering Council

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Fiber Optic Signal Interconnect and Amber Alert System (Garden Grove, CA) - This is the first fiber optic communication project within the City that consists of installing approximately seventeen (17) miles of fiber optic cable interconnecting

approximately twenty-two (22) signals, providing fiber optic communication to six (6) Circuit Television cameras (CCTV) and two (2) Dynamic Message Signs (DMS). The proposed fiber optic communication system will connect to the City's Traffic Management Center (TMC) and the City's Police Department control center. The Police Department will also have access to CCTV camera system and control the DMS in order to provide messages for an amber alert. This project includes upgrading the City's existing TMC integrating the City's existing hardwire (copper) communication and the proposed fiber optic communication systems. A project area master plan/system architecture was developed to show the proposed communication network system. Mr. Dorado serves as the Project Engineer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the traffic signal interconnect systems, and CCTV systems.

City of Orange Fiber Optic Interconnect and Closed Circuit Television (CCTV) Camera Surveillance System Project (Orange, CA) - This project consisted of installing a fiber optic interconnect system and a hardwired interconnect system to coordinate the signalized intersections along Katella Avenue, Tustin Street, Main Street and La Veta Avenue. The project also involved the installation of Closed Circuit Television (CCTV) camera systems at seventeen (17) locations to provide the City of Orange the capability to observe traffic operations. The proposed fiber optic interconnect system will connect to the City's Traffic Management Center (TMC). A project area master plan/system architecture was developed to show the proposed communication network system. Mr. Dorado serves as the Project Engineer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the traffic signal interconnect systems, and CCTV systems.

Video Surveillance Integration Gap Closure Project (Culver City, CA) - This project consisted of installing closed circuit television system at ten (10) signalized intersections along Jefferson Boulevard, Culver Boulevard, Washington Boulevard and Sepulveda Boulevard to provide the City of Culver City the capability to observe traffic operations and expand their system architecture. The project also included installation of a 48-strand single mode fiber optic communication system to link the CCTV systems to the City Hall Hub and the Maintenance Yard. The project also included a CCTV workstation at the maintenance yard. Mr. Dorado served as the Project Engineer and was responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the CCTV systems and the fiber optic system.

Ocean Avenue and 2nd Street Fiber Optic and CCTV Communication Project (Santa Monica, CA) - This project consists of installing a fiber optic interconnect system to coordinate ten (10) signalized intersections along Ocean Avenue and installing Closed Circuit Television camera systems (CCTV) at three (3) locations to provide the City of Santa Monica the capability to observe traffic operations. The project also includes a fiber optic system along 2nd Street to link to the City's four (4) Parking Structures. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Dorado serves as a Project Designer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

Santa Monica Boulevard Fiber Optic Communication Project (Santa Monica, CA) - This project consists of installing a fiber optic interconnect system to coordinate eight (8) signalized intersections along Santa Monica Boulevard. The project also includes a link to the City's communication room of the City's new library along Santa Monica Boulevard. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Dorado serves as a Project

Designer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

Orange County Transportation Authority (OCTA) Bus Rapid Transit (BRT) Project (Orange County, CA) 2006 - This is the County's first Bus Rapid Transit (BRT) project that consists of three corridors (approximately 70 miles) throughout fourteen (14) agencies/jurisdictions. RBF is part of the Project Management Team providing Traffic Engineering Services, responsible for determining the type of TSP system, WIFI system communications between next bus count down signs, the TSP system and the existing Automatic Vehicle Location (AVL)/GPS system, coordinating with the fourteen (14) agencies/jurisdictions in regards to traffic related issues, community outreach, developing schedules to expedite the project, cost estimates and proposals. Mr. Dorado serves as the Project Engineer.

Mark Esposito, PE, TE, PTOE

Project Engineer

Mr. Esposito's role as a Project Manager in the Public Works / Traffic Engineering Department is to provide project management support and design expertise for the various traffic related projects. His areas of expertise are signal design and signal operations, including the development, implementation and calibration of coordination timing. Other areas of expertise include the design of signing, striping, lighting, and traffic control, including the preparation of project plans, specifications and estimates. Mr. Esposito is a registered professional Traffic Engineer, and is IMSA certified as a Work Zone Safety Specialist and Level II Traffic Signal Technician.

RELEVANT EXPERIENCE:

SR-57 Freeway Widening ITS Improvements (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to improve their fiber optic communication system, CCTV system, DMS system, ramp metering system, and lighting system along SR-57 from Orangethorpe Avenue to north of Yorba Linda Boulevard.

Orange Fiber Optic Interconnect Project (Orange, CA) - The project involved the installation of approximately four miles of fiber optic cable and conduit on portions of Main Street, Katella Avenue and Chapman Avenue in the City of Orange creating a link between the City Hall and Public Works buildings and connecting nine traffic signals to the City's Traffic Management Center (TMC). The design included a fiber optic splice vault to be installed at the intersection of Chapman Avenue and Main Street creating a centralized hub for future expansion of the system and future deployment of ITS components. The project design included the processing of all required permitting with Southern California Regional Rail Authority (SCRRA) to cross under two separate at-grade rail crossings, and the processing of an encroachment permit with Orange County Flood Control District for crossing of the Collins Channel. As the Project Engineer, Mr. Esposito was responsible for oversight of the permitting and all design issues related to preparation of project plans, project specifications and probable cost estimates.

Signal Timing and Coordination Project (Garden Grove, CA) - Project Manager, providing signal timing and coordination services for thirty-nine (39) intersections along the Chapman Avenue and Lampson Avenue corridors in the City of Garden Grove. This project involved traffic data collection, survey of existing intersections and corridors, "Before" and "After" studies, arterial analysis, timing plan development, timing plan implementation and

Registration:

2006, Civil Engineer, CA, C69921

2003, Traffic Engineer, CA, TR2169

2007, Professional Traffic Operations Engineer, US, 2137

Years of Experience: 18

Education:

Certificate, 1991, Fundamentals of Traffic Engineering, Institute of Transportation Studies

A.S., 1991, Electronics, Citrus College

Coursework, Engineering Technology, California State Polytechnic University, Pomona

Professional Affiliations:

Member, Institute of Transportation Engineers (ITE)

Member, American Society of Civil Engineers

Member, International Municipal Signal Association (IMSA)

Member, Orange County Traffic Engineering Council (OCTEC)

timing plan calibration. In addition, RBF prepared a project report that included all of the data collected, analysis, studies, travel-time data, timing sheets and time-space diagrams.

Traffic Engineering Design and Signal Timing and Coordination Project (Simi Valley, CA) - Project Manager. RBF is currently providing signal timing and coordination and design services to improve traffic flow in the City of Simi Valley through the synchronization of 32 signalized intersections on five major arterials. These five arterials are Alamo Street, Cochran Street, Los Angeles Avenue, Royal Avenue, and Sycamore Drive.

Mariner's Mile Gateway, Coast Highway (City of Newport Beach, CA) - RBF was tasked to provide overall project coordination between seven project consultants and with the preparation of stage construction, and signing and striping plans for the widening of Coast Highway (SR-1) at Dover. Mr. Esposito served as the project manager responsible for the work in the State right-of-way. This project required close coordination with Caltrans to mesh proposed project improvements with proposed State improvements at the same location. Good direction, oversight, and regular communication with Caltrans were required to execute this project.

Oso Parkway / Pacific Park Drive Traffic Timing and Signalization (Orange County, CA) 2008 - Project Manager. This project spanned approximately nine miles and consisted of 34 traffic signals. The objective was to improve arterial traffic flow, improve travel-time and reduce delay. The added benefits of improving traffic flow also include reduced fuel consumption and improved air quality. The project was a multi-agency, inter-jurisdictional project and required extensive coordination with the participating agencies and Caltrans.

Jamboree Road and Chapman Avenue Improvement Project (East Orange, CA) - This project involved major roadway improvements to both Jamboree Road and Chapman Avenue in the City of Orange, CA. Included in this project was a major alignment shift for Chapman Avenue/Santiago Canyon Road requiring extensive stage construction plans to maintain traffic flow and safety during construction of the roadway and 8-foot diameter storm drain. Traffic related tasks included the installation of four new traffic signals, modification of five existing traffic signals, street lighting, fiber optic signal communication system, installation of three Closed-Circuit Television (CCTV) cameras, signing and striping plans, and stage construction/traffic handling plans. Mr. Esposito was the Project Manager for all traffic related tasks on this project.

State Route 60 / Market Street - Traffic Signal Timing and Coordination (City of Riverside, CA) - Traffic Engineering Manager. RBF was given the task to improve traffic flow through timing coordination of 3 intersections on Market Street and SR-60 ramps. Mr. Esposito was responsible for conducting fieldwork, collection, organization and presentation of all project related data including counts, turning movement counts, before and after study data, and preparation of the final project report, which included incorporating data by using Synchro, Webster, TSPP and other traffic engineering software.

Armando Solis, PE

Design Engineer

Mr. Solis has experience in the design of traffic signals, legacy/Ethernet communication systems, CCTV Systems, DMS Systems, lighting and sign illumination, pavement delineation, signing, pavement rehabilitation, construction staging, geometric design, layout and profiles. Mr. Solis has extensive experience in the use of AutoCAD, Microstation, and Inroads computer programs. Mr. Solis also has experience in signal operations. He has completed several projects in Southern California and Nevada for clients such as County of Riverside, Stanislaus County, OCTA, Caltrans District 7, 8, 11, 12, NDOT, Clark County and the cities of Santa Ana, Garden Grove, Pomona, San Diego, Long Beach, Palm Desert, La Quinta, Marina, Orange, Chino, San Marcos, Las Vegas, South Gate, Temecula, Irvine, and Santa Monica.

RELEVANT EXPERIENCE:

SR-57 Freeway Widening ITS Improvements (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to improve their fiber optic communication system, CCTV system, DMS system, ramp metering system, and lighting system along SR-57 from Orangethorpe Avenue to north of Yorba Linda Boulevard.

Ocean Avenue and Santa Monica Boulevard Project (City of Santa Monica, CA) - As Design Engineer, Mr. Solis prepared traffic signal plans for seven locations within the city that required modification to the exiting condition in addition to implementing video detection on five of the intersections.

Jamboree Road and Chapman Avenue Improvement Project (East Orange, CA) - This project involved major roadway improvements to both Jamboree Road and Chapman Avenue in the City of Orange, CA. Included in this project was a major alignment shift for Chapman Avenue/Santiago Canyon Road requiring extensive stage construction plans to maintain traffic flow and safety during construction of the roadway and 8-foot diameter storm drain. Traffic related tasks included the installation of four new traffic signals, modification of five existing traffic signals, street lighting, fiber optic signal communication system, installation of three Closed-Circuit Television (CCTV) cameras, signing and striping plans, and stage construction/traffic handling plans. Mr. Esposito was the Project Manager for all traffic related tasks on this project.

Registration:

2008, Civil Engineer, CA, 72012

Years of Experience: 9

Education:

B.S., 1999, Civil Engineering, California State University, Fullerton

Professional Affiliations:

Member, Institute of Transportation Engineers

Member, Orange County Traffic Engineering Council (OCTEC)

Member, American Society of Civil Engineers

Traffic Engineering Design and Signal Timing and Coordination Project (Simi Valley, CA) - RBF is currently providing signal timing and coordination and design services to improve traffic flow in the City of Simi Valley through the synchronization of 32 signalized intersections on five major arterials. These five arterials are Alamo Street, Cochran Street, Los Angeles Avenue, Royal Avenue, and Sycamore Drive.

Oso Parkway / Pacific Park Drive Traffic Timing and Signalization (Orange County, CA) - Assistant Engineer. This project spanned approximately nine miles and consisted of 34 traffic signals. The objective was to improve arterial traffic flow, improve travel-time and reduce delay. The added benefits of improving traffic flow also include reduced fuel consumption and improved air quality. The project was a multi-agency, inter-jurisdictional project and required extensive coordination with the participating agencies and Caltrans.

Interstate 710 / Firestone Boulevard Interchange- Phase III (South Gate, CA) - The project involves street widening, utility relocation and median improvements of Firestone Boulevard from El Paseo to the easterly City's limits. Mr. Solis served as the Design Engineer. Mr. Solis was responsible for the preparation of plans, and probable cost estimates for roadway lighting, bridge lighting, signing and striping, and staged construction/traffic handling. The project involves preparation of staged construction/traffic handling plans for the construction of the proposed bridge widening over the Rio Hondo.

Eisenhower Drive Improvements (La Quinta, CA) - This project involved street widening, utility and median improvements of Eisenhower Drive from Coachella Drive to Washington Street. Mr. Solis served as the Design Engineer. Mr. Solis was responsible for the preparation of plans and probable cost estimates for signing and striping improvements.

Interstate 5 Gateway Project (Orange County, CA) - This project will increase the existing six-lane section by adding one general purpose and one HOV lane in each direction, including interchange modifications, bridge reconstruction and new auxiliary lanes. Mr. Solis served as Design Engineer. Mr. Solis assisted with the preparation of plans for the traffic handling, signing and striping, and traffic signals.

Nuevo Road and Antelope Road Project (Riverside County, CA) - Mr. Solis served as the Design Engineer. Mr. Solis was responsible for the preparation of plans, and probable cost estimates for the traffic signal and signing and striping.

Traffic Engineering Design and Signal Timing and Coordination Project (Simi Valley, CA) - Project Manager. RBF is currently providing signal timing and coordination and design services to improve traffic flow in the City of Simi Valley through the synchronization of 32 signalized intersections on five major arterials. These five arterials are Alamo Street, Cochran Street, Los Angeles Avenue, Royal Avenue, and Sycamore Drive.

Mariner's Mile Gateway, Coast Highway (Newport Beach, CA) - RBF was tasked to provide overall project coordination between seven project consultants and with the preparation of stage construction, and signing and striping plans for the widening of Coast Highway (SR-1) at Dover. Mr. Esposito served as the project manager responsible for the work in the State right-of-way. This project required close coordination with Caltrans to mesh proposed project improvements with proposed State improvements at the same location. Good direction, oversight, and regular communication with Caltrans were required to execute this project.

Jessica Parreno, PE

Design Engineer

Ms. Parreno serves as a Design Engineer in the Public Works/Traffic Engineering Department. She is responsible for signing and striping, traffic control, traffic signal, and legacy/Ethernet communication plans. Ms. Parreno also has experience providing calculated quantities for construction, removals, and cost estimates.

RELEVANT EXPERIENCE:

SR-57 Freeway Widening ITS Improvements (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to improve their fiber optic communication system, CCTV system, DMS system, ramp metering system, and lighting system along SR-57 from Orangethorpe Avenue to north of Yorba Linda Boulevard.

Chapman Avenue (Santiago Canyon Road) and Jamboree Road (Orange, CA) - RBF prepared the design for the widening of Jamboree Road from the city limits of Orange to Santiago Canyon Road and the widening of Santiago Canyon Road from Jamboree Road to the SR-261 Interchange. The traffic engineering tasks for this project included the addition of 4 new traffic signal plans, 5 traffic signal modification plans, fiber optic communication/CCTV system plans, construction stage/traffic handling plans, and pavement delineation plans. Ms. Parreno was responsible for the signage and pavement delineation of the project.

Oso Parkway / Pacific Park Drive Traffic Timing and Signalization (Orange County, CA) - Design Engineer responsible for preliminary field work. This project spanned approximately nine miles and consisted of 34 traffic signals. The objective was to improve arterial traffic flow, improve travel-time and reduce delay. The added benefits of improving traffic flow also include reduced fuel consumption and improved air quality. The project was a multi-agency, inter-jurisdictional project and required extensive coordination with the participating agencies and Caltrans.

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (Tustin, CA) - This project included roadway improvements onsite and offsite of the former Tustin Marine Base. Ms. Parreno was responsible for the signing and striping, traffic signal, and traffic signal interconnect plans on Warner Avenue from Red Hill Avenue. to Tustin Ranch Road. She also served as a supervisor for others.

Registration:

2008, Civil Engineer, CA, 73167

Years of Experience: 4

Education:

B.S., 2004, Civil Engineering, San Jose State University, San Jose, CA

Professional Affiliations:

Member, American Society of Civil Engineers (ASCE)

Member, Institute of Transportation Engineers (ITE)

Member, Orange County Traffic Engineering Council (OCTEC)

2001-2004, Member, American Society of Civil Engineers (ASCE), San Jose State University Chapter 2003-2004, Secretary

2002-2004, Member, Chi Epsilon, San Jose State University Chapter

Tariq Baha

Design Engineer

Mr. Baha serves as a Design Engineer in the Public Works / Traffic Engineering Department. He has experience in the design of traffic signals, signal communication systems, pavement delineation, signing, pavement rehabilitation, construction staging and traffic control. Mr. Baha has also been working on signal timing & synchronization operations, in which, he assists in the development, implementation and calibration of coordination timing.

RELEVANT EXPERIENCE:

SR-57 Freeway Widening ITS Improvements (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to improve their fiber optic communication system, CCTV system, DMS system, ramp metering system, and lighting system along SR-57 from Orangethorpe Avenue to north of Yorba Linda Boulevard.

Mariner's Mile Gateway, Pacific Coast Highway (City of Newport Beach, CA) - RBF was given the task to design stage construction, signing and striping plans for the widening of PCH at Dover. Mr. Baha served as design engineer and was responsible for the preparation of traffic control, signing and striping plans for the widening of PCH at Dover Dr.

Signal Timing and Coordination Project (City of Garden Grove, CA) - RBF was given the task for the coordination and timing of all signalized intersections on Chapman Avenue and Lampson Avenue in the city of Garden Grove. Mr. Baha was responsible for conducting fieldwork, collection, organization and presentation of all project related data including counts, turning movement counts, before and after study data, and preparation of the final project report, which included incorporating data by using Synchro and other traffic engineering software.

Anaheim Boulevard at Broadway (City of Anaheim, CA) - RBF prepared the design for the reconstruction of Anaheim Blvd at Broadway. Mr. Baha was responsible for the design preparation of stage construction, traffic control, signing & striping and traffic signal design modification plans at Anaheim Blvd and Broadway.

Years of Experience: 6

Education:

B.S., 2002, Civil Engineering, California State University, Fullerton

Professional Affiliations:

Member, Institute of Transportation Engineers (ITE)

Member, Orange County Traffic Engineering Council (OCTEC)

2000-2002, Member, American Society of Civil Engineers (ASCE), California State University, Fullerton, Chapter

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (City of Tustin) - This project included roadway improvements onsite and offsite of the former Tustin Marine Base. The traffic engineering tasks included in this project were the addition of new traffic signals, stage construction and traffic handling, and signing and striping plans. Mr. Baha was responsible for stage construction plans for the street improvement on Warner Avenue, from Red Hill Avenue to Pullman Dr, design of traffic signal plans for Barranca Parkway & Aston road and Armstrong Avenue intersections, and traffic signal interconnect plans on Tustin Ranch Road from Barranca Parkway to North Warner, and Warner Avenue from Tustin Ranch Road to Legacy Park.

Ventura County Roadway Improvement project (County of Ventura) - This Project includes roadway improvement plans on two intersections operated by the country of Ventura in the city of Oxnard. RBF is tasked with Pavement delineation modification and traffic signal modification plans. Mr. Baha serves as the Design Engineer for the preparation of Traffic Signal Modification plans for Rose Avenue & Central Avenue and Santa Clara Avenue & Friedrich intersections.

Kellen Sporny

Design Engineer

Registration:

2004, Engineer-In-Training, PA, ET006372

Years of Experience: 4

Education:

B.S., 2004, Civil Engineering, Arizona State University

Mr. Sporny serves as a Design Engineer in the Public Works/Traffic Engineering Department. He is responsible for signing and striping, traffic control, traffic signal, traffic signal communicaiton plans, CCTV Systems, roadway lighting analysis and design, and transportation planning. Mr. Sporny also has experience providing calculated quantities for construction, removals, and cost estimates.

His experience in transportation planning has involved traffic impact studies and traffic forecast modeling. In addition, he has extensive experience in the use of technical software including: TRAFFIX, SYNCHRO, AUTOCAD 2006, Microstation, Visual, and the Highway Capacity Manual software (HCS).

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Ring Road Improvements (Temecula, CA) - This project included the modification and improvement of existing infrastructure along Ring Road and the adjacent major roadways. The traffic engineering tasks include singing and striping improvements, traffic signal improvements, fiber optic communications, and CCTV Systems. .

Technology Drive Improvements (Irvine, CA) - This project included roadway improvements on Technology Drive in the vicinity of I-5 and SR 133. Traffic components included signing and striping, new traffic signal design, and traffic control. Mr.

Sporny was responsible for all traffic engineering design components.

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (Tustin, CA) - This project included roadway improvements onsite and offsite of the former Tustin Marine Base. Mr. Sporny was responsible for the roadway lighting analysis and design for the proposed roadway.

Transportation Center Traffic and Parking Study (Indio, CA) - As part of the City of Indio Downtown Redevelopment, RBF is providing traffic engineering services for the City of Indio proposed Multi-Modal Transportation Center. RBF is currently preparing the Traffic and Parking Study for the proposed improvements. This study analyzes the forecast traffic impacts associated with the proposed Transportation Center project, which will be a multi-land use / multimodal transportation center.

Rosalva Navarro

Assistant Engineer

Ms. Navarro serves as an Assistant Engineer in the Public Works/Traffic Engineering Department. She is responsible for traffic signal, traffic signal communication systems, traffic control, and signing and striping plans. Ms. Navarro also has experience providing calculated quantities for construction, removals, and cost estimates. Ms. Navarro has extensive experience in the use of AutoCAD, Microstation, Autoturn and Adobe Illustrator computer programs.

RELEVANT EXPERIENCE:

SR-57 Freeway Widening ITS Improvements (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to improve their fiber optic communication system, CCTV system, DMS system, ramp metering system, and lighting system along SR-57 from Orangethorpe Avenue to north of Yorba Linda Boulevard.

Fiber Optic Signal Interconnect and Amber Alert System (Garden Grove, CA) - This was the first fiber optic communication project within the City that consists of installing approximately seventeen (17) miles of fiber optic cable interconnecting approximately twenty-two (22) signals, providing fiber optic communication to six (6) Circuit Television cameras (CCTV) and two (2) Dynamic Message Signs (DMS). Ms. Navarro was responsible for the preparation of the engineering estimates.

Santa Monica Boulevard Fiber Optic Communication Project (Santa Monica, CA) - This project consisted of installing a fiber optic interconnect system to coordinate eight (8) signalized intersections along Santa Monica Boulevard. Ms. Navarro was responsible for engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (Tustin, CA) - The traffic engineering tasks included in this project were the design of 13 new traffic signals, 8 traffic signal modifications, 5.2 miles of signal communications, stage construction and traffic handling, and signing and striping plans. Ms. Navarro is responsible for the preparation of signing/striping plans. Ms. Navarro was also responsible for probable cost estimates for all traffic signal, traffic signal interconnect, signing and striping improvements and stage construction/traffic handling.

Registration:

2006, Engineer-In-Training, CA, 127325

Years of Experience: 1

Education:

B.S., 2007, Civil Engineering, California Polytechnic University, Pomona, CA

Professional Affiliations:

Member, Institute of Transportation Engineers (ITE)

Member, Orange County Traffic Engineering Council (OCTEC)

Member, American Society of Civil Engineers (ASCE)

2004-2007, Member, Institute of Transportation Engineers (ITE), California Polytechnic University Pomona Chapter

2005-2006, Secretary

2006-2007, Fundraising Chair

2004-2007, Member, American Society of Civil Engineers (ASCE), California Polytechnic University Pomona Chapter

2004-2005, Activities Coordinator

RBF CONSULTING

Jonathan Hofert

Assistant Engineer

Mr. Hofert is responsible for signing and striping, traffic signals, traffic control, and inter-connect plans for transportation improvement projects. In addition, he has prepared Project Study Report (PSR) level traffic studies.

Registration:

Engineer-In-Training, CA, 27057

Years of Experience: 2

Education:

B.S., 2007, Civil Engineering, California State Polytechnic, Pomona

Professional Affiliations:

Member, ITE

RELEVANT EXPERIENCE:

Mid-County Parkway (Riverside County, CA) - Design Engineer. RBF worked as a subconsultant for the Project Approval phase of a 10-mile segment of a 32-mile new highway corridor serving western Riverside County. The highway is planned to accommodate future growth and relieve congestion on existing highways by providing a new route from SR-79 in San Jacinto on the eastern end, to I-15 in Corona on the western end. The highway is planned as a new 8-lane freeway meeting Caltrans standards, policies and guidelines. The project is reviewed and approved by Caltrans and FHWA. The project approval phase of work includes alternative designs for corridor routes, freeway to freeway interchanges, local interchanges, value analysis, preparation of Modified Access Reports, Project Reports, Hydrology Reports, Storm Water Data Reports, and Advanced Planning Studies for proposed structures. As part of the traffic impacts analysis, I-15 was studied to be widened from 4 lanes in each direction to 6 lanes in each direction from the MCP connection to SR-91, a distance of eight miles.

Clinton Street / Miles Avenue Widening and Miles Avenue Bridge (City of Indio and Riverside County) - Design Engineer. RBF was responsible for the design of Clinton Street and Miles Avenue widening as well as the Miles Avenue bridge design. Mr. Schneider served as the Traffic Engineer.

Caltrans Transportation Management Center (TMC), Southern Regional Laboratory (SRL), Park & Ride Design and Value Analysis (San Bernardino County, CA) - Design Engineer. RBF was responsible the preparation of final Plans, Specifications, and Estimates (PS&E) for the SRL/TMC "Early Project Design Improvement". The improvements will improve the 20-acre parcel for ultimate construction of the proposed TMC and SRL buildings, reflecting approximately $80 M of facility cost. RBF is responsible for all project elements for roadway, traffic, drainage, grading, utility, electrical, water, and sewer design and is also coordinating design survey and right-of-way mapping services for the required right of way.

Rocelda C. Lindquist, PE

Design Engineer

Ms. Lindquist has extensive background and experience in highway design and highway improvement projects from conceptual to final PS&E design. She has prepared numerous final PS&E projects in Caltrans Districts 7, 8 and 12. She is also experienced in the Design/Build process for large scale transportation projects. Ms. Lindquist is highly proficient in Intergraph Inroads Releases 4 and 5 (highway design software) and CADD software MicroStation. She is adept at supervising and organizing staff in the production of preliminary and final plans, coordinating resolutions to critical issues and interfacing with clients and subconsultants. Ms. Lindquist has prepared preliminary and final PS&E for the following projects:

Registration:

1995, Civil Engineer, CA, 54046

Years of Experience: 19

Education:

B.S., 1988, Civil Engineering

Professional Affiliations:

Member, American Society of Civil Engineers

Member, National Civil Engineering Honor Society, Chi Epsilon

RELEVANT EXPERIENCE:

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (Tustin, CA) - This project included roadway improvements onsite and offsite of the former Tustin Marine Base. The traffic engineering tasks included in this project were the addition of new traffic signals, stage construction and traffic handling, and signing and striping plans. Ms. Parreno was responsible for the signing and striping, traffic signal, and traffic signal interconnect plans on Warner Avenue from Red Hill Avenue. to Tustin Ranch Road. She also served as a supervisor for others.

Route 1 (PCH) Improvements and Traffic Signal at El Morro School and State Park (Orange County, CA) - Project Engineer responsible for the preparation of final plans, specifications and cost estimate of the intersection improvements. The improvements include the widening of PCH, installation of a new traffic signal and removal of existing traffic signal.

Interstate 5 / Culver Drive Southbound Exit Ramp, OCTA (Irvine, CA) - The principle project objective was elimination of the chokepoint at the southbound I-5 exit ramp. The primary improvements include reconfiguration of the existing single lane southbound exit ramp to a mainline auxiliary lane and a two-lane exit ramp with the addition of the fourth lane at the ramp terminus. Critical design aspects included coordination of project design with two other improvement projects: 1) a Caltrans Safety Investigation Project which proposes a modification of the traffic signals at the southbound exit ramp terminus, and 2) a City of Irvine improvement project providing a fifth lane to the southbound exit ramp terminus and widening of Culver Drive through the interchange area. Ms. Lindquist assisted in developing the traffic

plans and technical specifications including traffic signal, lighting, detour, traffic handling , sign and pavement delineation.

Jamboree Road and Chapman Avenue Improvement Project (East Orange, CA) - This project involved major roadway improvements to both Jamboree Road and Chapman Avenue in the City of Orange, CA. Included in this project was a major alignment shift for Chapman Avenue/Santiago Canyon Road requiring extensive stage construction plans to maintain traffic flow and safety during construction of the roadway and 8-foot diameter storm drain. Ms. Lindquist assisted in developing the new traffic signal plans.

State Route 133 Laguna Canyon Road Widening from Interstate 405 to Lake Forest Drive (Irvine, CA) - Project Engineer responsible for the preparation of the final traffic plans, traffic specifications and estimates for widening improvements of Laguna Canyon Road (SR-133) from Interstate 405 to the proposed Lake Forest Drive Intersection. Ms. Lindquist was responsible for stage construction, signing, and pavement delineation plans. Engineering Plans were completed according to Imperial Caltrans Plans Preparation Manual, Caltrans Highway Design Manual and Standard Plans.

Scott Eisenhart, PE

Design Engineer

Mr. Eisenhart joined RBF's civil engineering working on improvements for land development projects and public works projects in 2002. He had brought pervious traffic engineering and land development experience to RBF. Some of his current responsibilities include managing the preparation of traffic signal design, signing and striping, traffic control plans, and providing engineering solutions to traffic related issues. His previous land development responsibilities included managing the preparation of improvement plans for grading, street deign, and utility design.

RELEVANT EXPERIENCE:

City of Oceanside Traffic Signals (Oceanside, CA) - Mr. Eisenhart provided design plans for three new traffic signals at three separate intersections for the City of Oceanside. Mr. Eisenhart coordinated with City staff, and utility companies in the preparation of these design plans.

Heritage Plaza Traffic Engineering Services (Riverside County, CA- As Project Manager, Mr. Eisenhart was responsible for providing traffic-engineering support to the McCall Sun City, LLC, for the design of their Commercial Development project located in the County of Riverside, CA. Mr. Eisenhart prepared and facilitated traffic-engineering plans that included signing and striping plan, a traffic signal, an offsite traffic signal modification, and traffic signal interconnect.

Grand Plaza Traffic Engineering Services (San Marcos, CA) - Mr. Eisenhart provided traffic-engineering support to World Premier Investments for the design of a Retail Center located in San Marcos, CA. Mr. Eisenhart prepared the signing and striping plans for Las Posas Road widening and also prepared the signing and striping plans for Via Vera Cruz widening, new traffic signal designs and traffic signal modifications for three new intersections.

3rd Street/ Alameda Boulevard and 4th Street/Alameda Boulevard Traffic Signals (Coronado, CA) - Mr. Eisenhart provided traffic-engineering support for two new traffic signals along Alameda Boulevard for the City of Coronado. Mr. Eisenhart coordinated with City staff, utility companies, and Caltrans in the preparation of these design plans.

Linda Vista Drive (San Marcos, CA) - Mr. Eisenhart provided traffic-engineering support for the design of three (3) new signal plans and a signal modification along Linda Vista Drive CIP for the City of San Marcos.

Registration:

2005, Professional Civil Engineer, CA, C68233

Years of Experience: 14

Education:

B.S., 1994, Civil Engineering, San Diego State University

Professional Affiliations:

Institute of Transportation Engineers

American Society of Civil Engineers

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Casey Murdie, PE

Design Engineer

Mr. Murdie serves as a Project Engineer in the Public Works / Traffic Engineering Department. He is responsible for preparation of plans, specifications, and estimates for intelligent transportation systems, traffic signals, legacy/Ethernet communication systems, lighting, dynamic message sign systems, stage construction / traffic handling, and signing and striping plans for various agencies throughout California.

Mr. Murdie also has experience in a variety of traffic engineering studies including traffic circulation studies, Level-Of-Service analysis studies, intersection alignment studies, sight distance analysis studies, traffic signal warrant studies, and stop sign warrant studies for government and private development projects.

Mr. Murdie has extensive experience in the use of technical software including: AUTOCAD, MICROSTATION, TRAFFIX, SYNCHRO, and AUTOTURN.

RELEVANT EXPERIENCE:

Fiber Optic Signal Interconnect and Amber Alert System (Garden Grove, CA) - Design Engineer. This is the first fiber optic communication project within the City that consists of installing approximately seventeen (17) miles of fiber optic cable interconnecting approximately twenty-two (22) signals, providing fiber optic communication to six (6) Circuit Television cameras (CCTV) and two (2) Dynamic Message Signs (DMS). The proposed fiber optic communication system will connect to the City's Traffic Management Center (TMC) and the City's Police Department control center. The Police Department will also have access to CCTV camera system and control the DMS in order to provide messages for an amber alert. This project includes upgrading the City's existing TMC integrating the City's existing hardwire (copper) communication and the proposed fiber optic communication systems. A project area master plan/system architecture was developed to show the proposed communication network system.

Ocean Avenue Traffic Signal System Upgrade and Fiber Optic Signal Communications (Santa Monica, CA) - This project consisted of installing a fiber optic interconnect system to coordinate ten (10) signalized intersections along Ocean Avenue and installing Closed Circuit Television camera systems (CCTV) at three (3) locations to provide the City of Santa Monica the capability to observe traffic operations. The project also included a fiber optic system along 2nd Street to link to the City's four (4)

Registration:

2007, Civil Engineer, CA, 71234

Years of Experience: 6

Education:

B.S., 2002, Civil Engineering, California Polytechnic State University, San Luis Obispo, CA

Professional Affiliations:

Past - Executive Vice President, Society of Civil Engineers, Cal Poly SLO Chapter 01' - 02'

Member, ASCE - American Society of Civil Engineers

Member, ITE - Institute of Transportation Engineers

Member, OCTEC - Orange County Traffic Engineering Council

RBF CONSULTING

Parking Structures. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Murdie served as the Project Engineer and was responsible for providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

State Route 710 ITS Mitigations Improvements (Pasadena, CA) - RBF was a subconsultant to provide traffic signal modification plans and estimates for twenty-three intersections along Sierra Madre Boulevard, San Gabriel Boulevard, and Marengo Avenue. The project involves the installation of CCTV systems, system detection, new 2070 controllers, tactile/audible pedestrian signal actuation, and protected/permissive left turn phasing This project also involves the installation of a Changeable Message Sign at one location. Mr. Murdie served as the Project Engineer and was responsible for the preparation of plans and probable cost estimates. The project involves coordination with two other Consultant Teams and Caltrans.

Anaheim On-Call Traffic Engineering Services (Anaheim, CA) - The project consists of providing traffic engineering services, signing and striping plans, traffic signal plans, and fiber optic communication plans. Mr. Murdie works closely with City staff to provide plans, specifications, and engineering estimates (PS&E) for various projects. Completed projects to date include Brookhurst Street and Brookmore Avenue Traffic Signal Installation Project, Greenleaf Street and Magnolia Avenue Traffic Signal Installation Project, Faircrest Drive and Western Avenue Traffic Signal Installation Project, Canyon Creek Road and Serrano Avenue Traffic Signal Modification Project, and the Lincoln Avenue Signal Improvement Project.

Lincoln Avenue Signal Improvement Project (Anaheim, CA) - This project consists of installing a fiber optic interconnect system and a hardwired interconnect system to coordinate the ten (10) signalized intersections on the eastern most segment of Lincoln Avenue and installing Closed Circuit Television Camera Systems (CCTV) at two (2) locations to provide the City of Anaheim the capability to observe traffic operations. The project also includes the implementation of the SCOOT (Split Cycle Offset Optimization Technique) adaptive signal control system using SCOOT detectors and upgrading existing traffic systems infrastructure. The proposed fiber optic interconnect system will connect to the City's Traffic Management Center (TMC).

Orange County Transportation Authority (OCTA) Bus Rapid Transit (BRT) Project (Orange County, CA) - This is the County's first Bus Rapid Transit (BRT) project that consists of three corridors (approximately 70 miles) throughout fourteen (14) agencies/jurisdictions. The elements of the BRT system include: BRT vehicles that will share traffic lanes with general traffic, providing travelers real-time passenger information via next bus count down signs at stop locations, internet, personal data assistants (PDA), transit signal priority (TSP), distinct bus identity, system branding and customized shelters. RBF is part of the Project Management Team providing Traffic Engineering Services, responsible for determining the type of TSP system, WIFI system, communications between next bus count down signs, the TSP system and the existing Automatic Vehicle Location (AVL)/GPS system, coordinating with the fourteen (14) agencies/jurisdictions in regards to traffic related issues, community outreach, developing schedules to expedite the project, cost estimates and proposals. Mr. Murdie served as a Design Engineer on the Project Management Team.

Gary Tolmie

Senior Designer

Years of Experience: 38

Mr. Tolmie specializes in the design of traffic signals, legacy/Ethernet communication system, CCTV Systems, DMS Systems, Traffic Surveillance Systems, Ramp Metering Systems, Signing and Striping, and Stage Construction/Traffic Handling.

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Video Surveillance Integration Gap Closure Project (Culver City, CA) - This project consists of installing closed circuit television system at ten (10) signalized intersections along Jefferson Boulevard, Culver Boulevard, Washington Boulevard and Sepulveda Boulevard to provide the City of Culver City the capability to observe traffic operations and expand their system architecture. The project also includes installation of a 48-strand single mode fiber optic communication system to link the CCTV systems to the City Hall Hub and the Maintenance Yard. The project also includes a CCTV workstation at the maintenance yard. Mr. Tolmie serves as the Project Designer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the design of the CCTV systems and the fiber optic system.

Ocean Avenue and 2nd Street (Santa Monica, CA) - This project consists of installing a fiber optic interconnect system to coordinate ten (10) signalized intersections along Ocean Avenue and installing Closed Circuit Television camera systems (CCTV) at three (3) locations to provide the City of Santa Monica the capability to observe traffic operations. The project also includes a fiber optic system along 2nd Street to link to the City's four (4) Parking

Structures. The proposed Signal Fiber Optic Interconnect System will connect to the existing Traffic Management Center (TMC) in the City Hall. Mr. Tolmie serves as the Project Designer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, and CCTV systems.

Citywide Traffic Control and Transit Signal Priority System (Beverly Hills, CA) - Design Engineer. RBF developed traffic signal and intersection lighting modification PS&E for twenty-seven (27) signalized intersections along two major corridors. The plans were designed to include new 2070 traffic signal controllers and the installation of special loop detectors (MTA loop detectors) that will be used as part of Metropolitan Transportation Authority (MTA) Bus Rapid Transit (BRT) System. The project included linking the citys new Traffic Control System with the City of Los Angeles ATSAC to support the Transit Signal Priority System.

Lexington Road and Burton Way Traffic Signal Improvements (City of Beverly Hills, CA) - The project involves modification of four traffic signals, installation of one new traffic signal with CCTV, and storm drain system and intersection improvements. The project also includes installation of traffic signal interconnect systems Along Lexington Road and Burton Way. Mr. Tolmie serves as the Senior Designer and is responsible for preparation of plans, specifications, and probable cost estimates for the proposed improvements.

San Marcos Boulevard Traffic Signal Fiber Optic Interconnect Project (San Marcos, CA) - This project consists of installing a fiber optic interconnect system to coordinate seventeen (17) signalized intersections along San Marcos Boulevard and Rancheros Drive and installing Closed Circuit Television camera systems (CCTV) at four (4) locations to provide the City of San Marcos the capability to observe traffic operations. The proposed Signal Fiber Optic Interconnect System will connect to the proposed Traffic Management Center (TMC) in the City Hall and will also extend to the Public Works Building. Mr. Tolmie serves as the Project Engineer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E) for the traffic signal interconnect systems, CCTV, the TMC and the Public Works workstation communication system. The project involved coordination with Caltrans District 11.

I-710 ITS Mitigations Improvements (Pasadena, CA) - RBF is a subconsultant to provide traffic signal modification plans and estimates for twenty-three intersections along Sierra Madre Boulevard, San Gabriel Boulevard, and Marengo Avenue. The project involves the installation of CCTV systems, system detection, new 2070 controllers, tactile/audible pedestrian signal actuation, and protected/permissive left turn phasing This project also involves the installation of a Changeable Message Sign at one location. As Senior Designer, Mr. Tolmie is responsible for the preparation of plans and probable cost estimates. The project involves coordination with two other Consultant Teams and Caltrans.

Red Light Photo Enforcement Improvements Various Locations (Los Angeles County, City of Beverly Hills CA) - This project consists of installing red light photo enforcement equipment at ten (10) signalized intersections throughout Los Angeles County and in the City of Beverly Hills. The project also includes the installation of video detection system at selected locations. Mr. Tolmie serves as the Senior Designer and is responsible for preparation of providing plans, specifications and engineering estimates (PS&E).

Michael T. Honda

Senior Designer

Mr. Honda has extensive experience in Public Works Engineering and Freeway improvement projects. He specializes in the design of traffic signal systems, legacy/Ethernet communication systems, CCTV systems, DMS systems, pavement delineation, signing, and stage construction/detour plans. His proficiency in CAD (both AutoCad and Mircostation) enables him to produce high quality plans using the highly efficient design/draft method.

Years of Experience: 30

Education:

B.A., 1974, Communications Design, University of Illinois, Chicago

Certificate, 1996, Intergraph Microstation

Professional Affiliations:

Member, Institute of Transportation Engineers

Member, Traffic Signal Association

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) - RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Interstate 405 / Jeffrey Road Interchange (Irvine, CA) - The project involved widening the northbound and southbound ramps and the widening of the Jeffrey Road Bridge, both entirely within existing Caltrans right-of-way. Mr. Honda served as the Project Designer for the traffic engineering tasks that included signage, pavement delineation, lighting system, ramp metering systems, traffic signals and summary of quantities plans. The project includes a temporary overheard fiber optic system during the construction stages. The project also includes relocating and modifying the existing Caltrans fiber optic trunk line and video surveillance systems including the video node hub.

State Route 55 / Edinger Avenue Widening and Pavement Rehabilitation Project (Santa Ana and Tustin, CA) - RBF is preparing plans, specifications and estimates for the widening of Edinger Avenue from a four-lane roadway to a major six-lane access-controlled urban arterial highway for 2.2 miles. The final improvements include street improvements, grading, drainage,

landscaping, retaining walls, traffic sign and striping, traffic signals, and traffic control. The project also includes ramp-widening improvements to the SR-55 on and off ramps from Edinger Avenue. This project required extensive coordination between the City of Santa Ana, City of Tustin, and Caltrans. Mr. Honda serves as the Project Designer for the traffic engineering tasks that include preparation of plans, specifications and probable cost estimates for traffic signals, traffic signal interconnect system, Highway Advisory Radio System (HAR) relocation, signing and striping, stage construction/traffic handling and Transportation Management Plan (TMP).

Artesia Boulevard Improvement Project (Torrance, CA) - Design Engineer responsible for the preparation of street lighting, traffic analysis, signal timing, traffic signal modifications, signing and striping plans, specifications and estimates for the Artesia Boulevard Improvement Project. This project, a 2.7 mile section of roadway rehabilitation, is part of the City's revitalization program to provide aesthetic enhancements and improve the safety and quality of life in the community. The work includes design for pavement rehabilitation, parkways, medians, sidewalk, curb and gutter, driveways, bus pads, median and parkway landscaping, storm drain, street lighting, traffic analysis, signal timing, stage construction, traffic handling, traffic signal modifications, signing and striping and federal funding applications.

Red Hill Avenue, Barranca Parkway Street Improvements (Tustin, CA) - This project included roadway improvements surrounding the former Tustin Marine Base. Mr. Honda was responsible for the design and production of traffic control plans during construction of street widening, median island modifications and the extension of a regional storm drain box culvert. These temporary traffic configurations caused some major temporary traffic lane diversions and temporary traffic signal modifications which were also included in the plans.

Interstate 55 / Indian Truck Trail (Riverside County, CA) - Lead Designer for the development of stage construction and traffic handling plans for widening of Indian Truck Trail and redesign of on and off ramps. Also included in the project was the design of signing, pavement delineation, and electrical plans including lighting, traffic signals and ramp metering.

Interstate 5 Gateway Project (Orange County, CA) - Mr. Honda served as a Project Designer for fiber optic communication, conceptual plans, stage construction, pavement delineation, roadway and overhead signs and lighting. This project will increase the existing six-lane section by adding one general purpose and one HOV lane in each direction, including interchange modifications, bridge reconstruction and new auxiliary lanes. The project included numerous bridges, freeway ramps, city streets, and 25' retaining walls. As the primary Subconsultant, RBF was responsible for the completion of the complex stage construction and traffic handling plans for the complete reconstruction of the mainline I-5 from north of Orangethorpe Avenue to north of Beach Boulevard as well as the signing, striping and traffic electrical plans including ramp metering, traffic monitoring station system, and lighting plans. Mr. Honda continues to work with the contractor on design issues as they occur out in the field.

Ryan Morehouse

Design Technician

Years of Experience: 3

Mr. Morehouse serves as our Cadd Technician in the Public Works/Traffic Engineering Department. He is responsible for signal communications, Closed Circuit Television (CCTV) Systems, Dynamic Message Signs Systems (DMS), Ramp Metering Systems (RMS), Traffic Monitoring Stations (TMS), signing and striping plans, and construction traffic control and detour plans. Mr. Morehouse also has experience providing calculated quantities for construction, removals, and cost estimates. Mr. Morehouse has extensive experience in the use of AutoCAD, Microstation, Autoturn and Adobe Illustrator computer programs.

RELEVANT EXPERIENCE:

SR-22 / I-405 West County Connectors (Orange County, CA) – Cadd Technician. RBF is currently preparing communication plans and details, technical specifications, and engineer's estimates to provide Caltrans District 12 their first Ethernet communication system. The project consist of installing an Ethernet fiber optic communication system that will link Caltrans facilities within the project area including traffic signal systems, ramp metering systems, traffic monitoring systems, closed circuit television (CCTV) systems, and dynamic message signs (DMS) to Caltrans District 12 Traffic Management Center (TMC). In addition, the new Ethernet communication system will require installation of hardware at the I-405/SR-22 Mini-Hub, I-5/SR-22 / La Veta Hub, I-405 / Euclid Hub, and at Caltrans District 12 TMC. The project also consist of providing plans and details, technical specifications, and engineer's estimates for temporary CCTV systems, ramp metering systems, traffic monitoring stations, and two (2) Dynamic Message Signs (DMS) during construction of the freeway improvements.

Fiber Optic Signal Interconnect and Amber Alert System (Garden Grove, CA) - Cadd Technician. This was the first fiber optic communication project within the City that consists of installing approximately seventeen (17) miles of fiber optic cable interconnecting approximately twenty-two (22) signals, providing fiber optic communication to six (6) Circuit Television cameras (CCTV) and two (2) Dynamic Message Signs (DMS).

Traffic Engineering Design and Signal Timing and Coordination Project (Simi Valley, CA) - Cadd Technician. RBF provided signal timing and coordination and design services to improve traffic flow in the City of Simi Valley through the synchronization of 32 signalized intersections on five major arterials. These five arterials are Alamo Street, Cochran Street, Los Angeles Avenue, Royal Avenue, and Sycamore Drive.

Tustin Ranch Road, Warner and Armstrong Street Improvements, Tustin Legacy (Tustin, CA) - Cadd Technician. This project included roadway improvements onsite and offsite of the former Tustin Marine Base. The traffic engineering tasks included in this project were the design of 13 new traffic signals, 8 traffic signal modifications, 5.2 miles of signal communications, stage construction and traffic handling, and signing and striping plans.

Santa Monica Boulevard Fiber Optic Communication Project (Santa Monica, CA) - Cadd Technician. This project consisted of installing a fiber optic interconnect system to coordinate eight (8) signalized intersections along Santa Monica Boulevard.